

## REVISION OF THE NORTH AMERICAN *SOBAROCEPHALA* (DIPTERA: CLUSIIDAE, SOBAROCEPHALINAE)

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### Abstract

*J. ent. Soc. Ont.* 138: 65–106

The 17 species of *Sobarocephala* Czerny, 1903 occurring in the Nearctic north of Mexico are reviewed and keyed. *Sobarocephala wirthi* spec. nov. and *S. pengellyi* spec. nov. are described from the eastern United States. Descriptions, illustrations, and distribution maps are provided for all Nearctic species.

*Published November 2007*

### Introduction

*Sobarocephala* Czerny, 1903, as redefined by Lonsdale and Marshall (2006), is a large, predominantly neotropical genus with 17 Nearctic species and at least a dozen described and undescribed species from the Afrotropical, Australian, and Oriental Regions. The Nearctic species do not form a monophyletic group, but instead belong to a number of independent lineages, several of which are tropical in origin. The North American fauna, including two new eastern species allied to *S. latifrons* (Loew), is here revised.

North American *Sobarocephala* species are small (2.4–5.6 mm), thin, pale yellow flies, often with distinctive brown patterning. Two male genitalic characters define the genus (a basal shield on the distiphallus and a “thumb” on the lateral lobe of the distiphallus (Lonsdale and Marshall 2006)), but *Sobarocephala* is most easily separated from other Nearctic Clusiidae by the absence of interfrontal bristles (found in *Clusiodes* Coquillett, 1904 and *Clusia* Haliday, 1838), the possession of inclinate anterior fronto-orbital bristles (reclinate in *Clusiodes* and *Craspedochaeta* Czerny, 1903), and the presence of a well-developed dorsal preapical bristle on the mid tibia (absent in *Clusia* and *Heteromeria* Czerny, 1903). A key to the North American genera of Clusiidae was provided in Soós (1987); we follow Woodley (1984) in treating the single Nearctic *Chaetoclusia* (*C. affinis* Johnson) identified in that key as *Sobarocephala*.

Although the Nearctic *Sobarocephala* were recently treated by Sabrosky and Steyskal (1974), considerable new material has become available since then, allowing us

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to reconsider the Nearctic fauna on the basis of over 1200 specimens. We here add two species to the genus, provide an updated key, list new distributional data, and draw attention to previously unrecognized sister-group relationships.

Materials and Methods

Material from the following institutions was examined for this revision: California Academy of Sciences, San Francisco (CASC); Carnegie Museum of Natural History, Pittsburgh (CMNH); Canadian National Collection, Ottawa (CNCI); University of Guelph Insect Collection, Guelph (DEBU); Entomological Museum of Utah State, Logan (EMUS); Instituto Nacional de Biodiversidad, Santo Domingo de Heredia (INBC); Museum of Comparative Zoology, Cambridge (MCZC); North Carolina State University, Raleigh (NCSSU); Texas A&M University, College Station (TAMU); Tel Aviv University, Tel Aviv (TAUI); United States National Museum, Washington, D.C. (USNM).

Specimen preparation and terminology follows that in Lonsdale and Marshall (2006). The  $M_{1+2}$  ratio is defined as the length of the ultimate section of vein M divided by the length of the penultimate section. Size ranges include both sexes. Label data for non-type material is not listed for the relatively abundant *S. flaviseta* (Johnson), *S. latifacies* Sabrosky & Steyskal, and *S. latifrons* (Loew). Maps only include Nearctic records.

Generic Diagnosis

Pedicle with pronounced outer and inner angulate extensions. Cell bm open or closed. Interfrontal bristle absent. Anterior fronto-orbital bristle inclinate. Vein  $R_1$  bare dorsally. Thorax usually with two postsutural dorsocentral bristles (rarely one or three in some tropical species). Presutural intra-alar bristle absent or weak in Nearctic species. Mid tibia with preapical dorsal bristle. Male 6<sup>th</sup> spiracle moved into membranous region anterior to annulus. Ventrolateral lobe of hypandrium setose and relatively large. Distiphallus almost always with basal shield (present in all Nearctic species); lateral lobe of distiphallus often with “thumb” (Fig. 20).

Key to the species of *Sobarocephala* north of Mexico

- 1. Arista densely plumose (Figs. 1, 2, 6, 7). Bristles usually yellow. Gena usually shiny. First flagellomere with dorsal stripe or spot around base of arista .....2
- Arista sparsely plumose or pubescent (Figs. 3–5). Bristles light brown to black. Gena pilose to silvery tomentose. First flagellomere entirely yellow dorsally (*S. texensis* and some *S. setipes* with light infuscation around base of arista and *S. flava* females with anterior margin lightly pigmented) .....5
- 2. Ocellar bristles minute to absent. Scutum with two pairs of spots; scutellum brown, at least in part. Sides of frons converging posteriorly. Female tergite 8 yellow. Surstylus with tubercle-like bristles apical. Southern United States .....3

- Ocellar bristles well-developed. Scutum and scutellum yellow. Sides of frons parallel. Female with basal half of tergite 8 brown. Surstylus with tubercle-like bristles along length of distal and posterior margins. Eastern United States .....4
- 3. Scutellum, laterotergites, and epandrium entirely brown (Fig. 1). Gena shiny. Cerci flush with distal margin of epandrium (Fig. 28). Surstylus subrectangular with long palisade-like bristles along inner-distal margin (Figs. 27, 28). Distiphallus large and spoon-shaped; lateral lobe without thumb (Fig. 29). Southeastern United States, Central America, Bahamas, Colombia .....*S. quadrimaculata* Soós
- Scutellum brown laterally (Fig. 2), laterotergites brown lateral to scutellum, and epandrium yellow. Gena silvery tomentose. Cerci projecting (Fig. 25). Surstylus triangular with apical tubercle-like bristles (Figs. 24, 25). Distiphallus relatively small and thin; lateral lobe with thumb (Fig. 26). Florida .....  
.....*S. cruciger* Sabrosky & Steyskal
- 4. Bristles and epandrium yellow (Fig. 6). Wing clear. Hind tibia and tarsi yellow. Frons yellow. Occiput occasionally pilose. Eastern United States .....  
.....*S. affinis* (Johnson)
- Bristles and epandrium brown (Fig. 7). Wing very lightly clouded on distal 1/3 along  $R_{2+3}$ . Hind tibia and tarsi sometimes brownish. Frons sometimes with anterior margin white. Occiput usually pilose. Eastern and southeastern United States .....  
.....*S. muesebecki* Sabrosky & Steyskal
- 5. Sides of frons converging posteriorly. Notopleuron and/or scutellum sometimes with white markings .....6
- Sides of frons parallel. Neither notopleuron nor scutellum with white spots .....8
- 6. Scutellum white. Scutum with brown supra-alar spot and basal quadrate stripe; notopleuron, postpronotum, and posterolateral scutal spots white (Fig. 5). Arista pubescent. Florida, Dominican Republic .....*S. atrifacies* Sabrosky & Steyskal
- Scutellum yellow. Scutum predominantly yellow, sometimes with brown markings; white markings, if present, restricted to notopleuron and postpronotum (Fig. 3). Arista short-plumose .....7
- 7. Bristles brown. Cell bm closed. Notum yellow with notopleuron and postpronotum white, at least in part (Fig. 3). Fore tarsi yellow. Female abdomen yellow with thin central stripe on tergite 3 and with wide light brown stripe (narrowing anteriorly) on tergites 4 and 5. Tubercle-like bristles on surstylus confined to apex (Fig. 19). Widespread in North America .....*S. flaviseta* (Johnson)
- Bristles black. Cell bm open. Notum yellow, sometimes with lateral margin brown (Fig. 4). Fore tarsi light brown, at least apically. Female abdominal tergites 2-5 with small brown anteromedial spot; tergites 6 and 7 dark brown. Tubercle-like bristles on surstylus extending onto posterior margin (Fig. 22). Northeastern North America and Utah .....  
.....*S. latifacies* Sabrosky & Steyskal
- 8. Scutellum entirely brown (Fig. 14). Frons sometimes with orange tint (darkest posteriorly). Scutum with one pair of wide postsutural stripes (connected posteriorly). Eastern North America .....*S. dreisbachi* Sabrosky & Steyskal
- Scutellum yellow, at least in part. Frons yellow. Pattern on scutum variable .....9
- 9. Scutellum usually with central brown stripe (sometimes only brown medially or apically), but if yellow with distal infuscation on ventromedial surface, then surstylus

hook-shaped (some *S. latifrons*; Fig. 48) or subtriangular (some *S. wirthi*; Fig. 45) .....10

– Scutellum entirely yellow or brown laterally; never yellow with ventromedial infuscation. Surstylus broadly rounded or bifid, but never hook-like or triangular .....14

10. Stripe on scutellum darkest at midpoint (Figs. 15, 17). Acrostichal bristle absent. Female tergite 2 with wide central stripe. Male abdomen with wide central stripe on tergites 2-5. Male sternite 5 with posteromedial comb of bristles. Surstylus small, lobate, and without tubercle-like bristles (Fig. 60) .....11

– Stripe on scutellum evenly brown or darkest at apex (Fig. 10). Acrostichal bristle present. Female tergite 2 brown along posterior margin or with thin central stripe. Male abdomen entirely yellow or with variable light brown pattern. Male sternite 5 without comb. Surstylus at least 2/3 length of epandrium with tubercle-like bristles along distal 2/3 of posterior margin (Fig. 43) .....12

11. Scutum yellow with one pair of brown spots on notopleuron and (usually) one pair of postsutural stripes (Fig. 15). First flagellomere yellow. Bristles light brown. Fore tibia yellow. Occiput pilose. Small bristle in front of anterior dorsocentral. Female tergite 6 with wide central stripe. Laterotergites sometimes brown laterally. Distiphallus short, and lateral lobe small and ovate (Fig. 61). Eastern North America north to Ottawa .....*S. setipes* Melander & Argo (in part)

– Scutum yellow, sometimes with light brown prescutellar spot extending onto scutellum (Fig. 17). First flagellomere with light infuscation around base of arista. Bristles brown. Fore tibia light brown. Occiput shiny. No small bristle in front of anterior dorsocentral. Female tergite 6 yellow. Laterotergites yellow. Distiphallus longer than half length of phallapodeme, and lateral lobe well-developed (Fig. 58). Texas .....*S. texensis* Sabrosky & Steyskal

12. Bristles light brown. Scutum with light brown lateral markings (Fig. 12). Male face light brown medially and female face sometimes orange medially. Epandrium dark brown. Surstylus small, rounded, and 2/3 length of epandrium (Fig. 42). Female tergite 6 brown, and tergites 2-4 yellow except for thin central brown stripe. Alabama, Georgia .....*S. pengellyi* spec. nov.

– Bristles dark brown to black. Scutum with variable lateral markings. Face yellow in both sexes. Epandrium predominantly or entirely yellow. Surstylus almost as long as epandrium. Female tergite 6 brown laterally and (sometimes) basally, and tergites 2-4 dark laterally (sometimes also dark medially). Eastern United States .....13

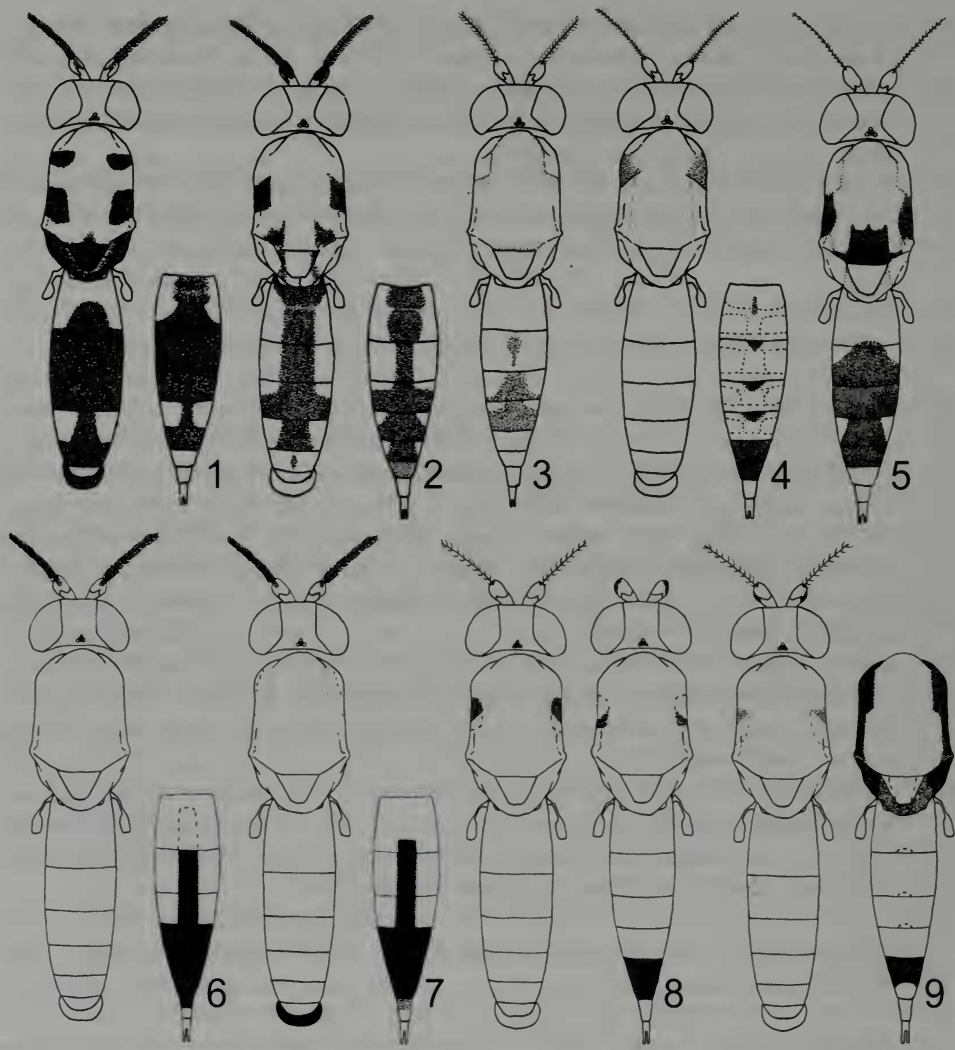
13. Surstylus hook-shaped (Fig. 48). Female abdomen sometimes with central brown stripe in addition to lateral markings (Fig. 10). Epandrium sometimes with small basal spot .....*S. latifrons* (Loew)

– Surstylus broad and rounded apically (Fig. 45). Female abdomen yellow medially (Fig. 11). Epandrium entirely yellow .....*S. wirthi* spec. nov.

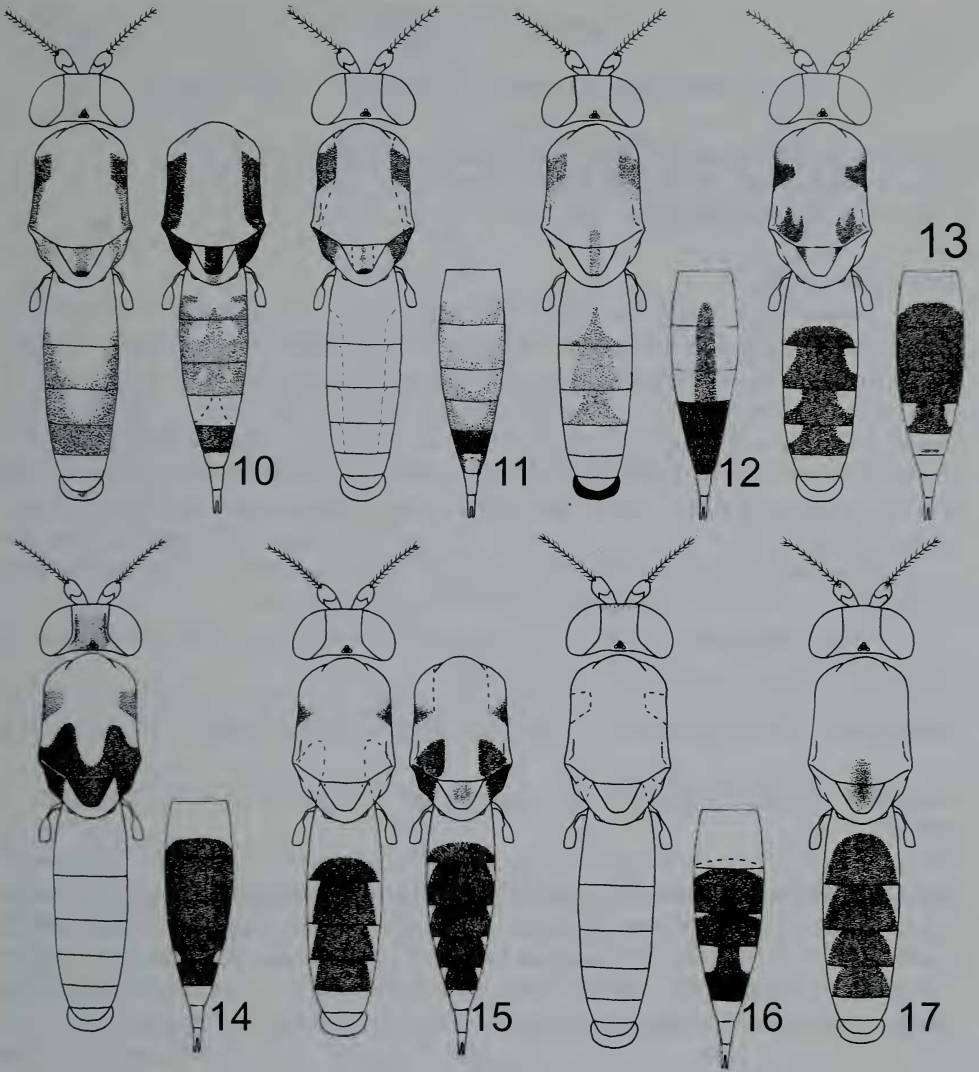
14. Female abdomen mostly or entirely yellow on tergites 1-5 and dark brown on tergite 6. Male abdomen entirely yellow and gena thin (height less than half that of first flagellomere). Surstylus large, lobate, and widest distally. Male cerci rounded and slightly projecting .....15



- Female abdomen with wide central stripe on tergites (2) 3-6 (interrupted on tergite 5 in some *S. lachnosternum* and on tergite 6 in *S. interrupta*). Male abdomen with wide central stripe, but if entirely yellow, gena as high as first flagellomere. Surstylus less than half length of epandrium, small, and rounded or bifid. Male cerci flush with distal margin of epandrium or sunken .....16
- 15. First flagellomere yellow in both sexes, with anterior margin lightly infuscated in females (Fig. 8). Wing lightly (sometimes indistinctly) clouded along  $R_{2+3}$  and costa (darkest distally). Female laterotergites yellow. Eastern United States, Texas, Utah .....*S. flava* Melander & Argo
- First flagellomere dark brown to black on ventral half (Fig. 9). Wing clear. Female laterotergites brown, at least in part. Northeastern North America, Kansas .....*S. atricornis* Sabrosky & Steyskal
- 16. Postsutural stripe serrate on anterior margin. Scutellum brown laterally (rarely yellow) (Fig. 13). Female tergite 6 yellow, sometimes with anteromedial spot. No small bristle in front of anterior dorsocentral. Anterior lateral scutellar bristle minute or absent. Surstylus bifid (Fig. 51). Male cerci flush with distal margin of epandrium (Fig. 52). Posterior margin of male sternite 5 without posteromedial comb. Southeastern United States, Illinois .....*S. interrupta* Sabrosky & Steyskal
- Postsutural stripe entire and rounded on anterior margin, if present. Scutellum usually yellow, but if lateral corner brown (some *S. setipes*), small bristle present in front of anterior dorsocentral. Female tergite 6 brown, at least medially. Anterior lateral scutellar bristle not much smaller than posterior bristle, if at all. Surstylus rounded. Male cerci sunken below distal margin of epandrium. Male sternite 5 with posteromedial comb .....17
- 17. Notopleuron brown posteriorly (females sometimes with most of notopleuron and postpronotum brown) and scutum with one pair of wide brown postsutural stripes (Fig. 15). Acrostichal bristle absent. Length 2.4-2.9 mm. Female abdomen with wide brown stripe on tergites 2-6. Eastern North America .....*S. setipes* Melander & Argo (in part)
- Scutum yellow with dark brown quadrate spot on notopleuron (sometimes faded in males and teneral specimens) (Fig. 16). Acrostichal bristle present. Length 3.9-4.9 mm. Female abdominal pattern as follows: tergite 2 sometimes brown along posterior margin, tergites 3 and 4 with wide central stripe, tergite 5 with narrow central stripe, and tergite 6 dark brown. Eastern and central North America .....*S. lachnosternum* Melander & Argo



FIGURES 1–9. 1–*Sobarocephala quadrimaculata* Soós; male (left) and female abdomen (right). 2–*S. cruciger* Sabrosky & Steyskal; male (left) and female abdomen (right). 3–*S. flaviseta* (Johnson); female. 4–*S. latifacies* Sabrosky & Steyskal; male (left) and female abdomen (right). 5–*S. atrifacies* Sabrosky & Steyskal; female. 6–*S. affinis* (Johnson); male (left) and female abdomen (right). 7–*S. muesebecki* Sabrosky & Steyskal; male (left) and female abdomen (right). 8–*S. flava* Melander & Argo; male (left) and female (right; arista not illustrated). 9–*S. atricornis* Sabrosky & Steyskal; male (left) and female (right; head not illustrated).



FIGURES 10–17. 10–*Sobarocephala latifrons* (Loew); male (left) and female (right; head not illustrated). 11–*S. wirthi* spec. nov.; male (left) and female abdomen (right). 12–*S. pengellyi* spec. nov.; male (left) and female abdomen (right). 13–*S. interrupta* Sabrosky & Steyskal; male (left) and female abdomen (right). 14–*S. dreisbachi* Sabrosky & Steyskal; male (left) and female abdomen (right). 15–*S. setipes* Melander & Argo; male (left) and female (right; head not illustrated). 16–*S. lachnosternum* Melander & Argo; male (left) and female abdomen (right). 17–*S. texensis* Sabrosky & Steyskal; male.

## Species Descriptions

### *Sobarocephala affinis* (Johnson, 1913) (Figs. 6, 39–41; Map 1)

*Chaetoclusia affinis* Johnson, 1913: 101. Melander & Argo, 1924: 9.

*Sobarocephala testacea* Soós, 1964: 449. Sabrosky & Steyskal, 1974: 378.

*Sobarocephala affinis*, Woodley, 1984: 120.

#### Redescription (Fig. 6)

**Male.** Body length 2.8–4.4 mm. Bristles yellow. Two dorsocentral bristles with one minute bristle in front of anterior dorsocentral. Acrostichal bristle absent. Two pairs of well-developed lateral scutellar bristles. Arista densely plumose. Sides of frons parallel. Body yellow except as follows: fore tibia usually light brown to brown; fore tarsi dark brown; coxae, base of femora, posterior half of katapisternum, parafacial and gena white; first flagellomere with dark spot around base of arista; occiput occasionally pilose. Male from Alabama with one pair of small spots behind suture, and lateral margin of postpronotum (and part of notopleuron) brown.  $M_{1+2}$  ratio 3.9–4.6. Wing clear. Cell bm open. Face flat.

**Female.** Externally similar to male except as follows: abdomen with median stripe on tergites (2) 3–4; tergites 5–7 and anterior half of tergite 8 brown.

**Male terminalia.** (Figs. 39–41) Similar to *S. muesebecki*, except pregonite ovate and hypandrium with four minute distal bristles.

**Distribution:** United States: AL, FL, GA, MA, NC, NJ, NY, VA (Map 1).

**Holotype.** UNITED STATES, VA: Cape Henry, 26 June 1939, A. L. Melander, ♂, USNM.

**Additional material examined.** UNITED STATES, AL: Kushla, 22 July 1914, A. H. Sturtevant, ♂, USNM; Baldwin Co., Bon Secour Nat. Wildlife Refuge, 5–7 May 1994, S. A. Marshall, ♂, DEBU; Bon Secour (site 4), Malaise, 19 October 2004, 30.30N, 88.74W, E. Benton, ♀, DEBU. FL: Alachua Co., Gainesville, Austin Cary Forest, insect flight trap, CO<sub>2</sub> baited, G. B. Fairchild, 6 August 1976, 2♂, 2♀, USNM; 9 August 1976, ♂, ♀, USNM; 13 August 1976, ♀, USNM; 20 August 1976, ♂, ♀, USNM; 17 September 1976, ♀, USNM; 30 July 1976, ♂, USNM; 26 July 1976, ♀, USNM; 16 August 1976, ♀, USNM; Gainesville, Pine Hill Estates, H. V. Weems Jr., Malaise trap, 26 September 1973, ♀, USNM; 3 October 1973, ♀, USNM; Gainesville, Pierce's homestead, 8 April 1976, W. H. Pierce, flight intercept trap, ♀, USNM; Mobile Co., Camp Scoutshire (site 24), Malaise trap, 14 December 2004, 31.05N, 88.18W, E. Benton, ♀, DEBU. GA: Liberty Co., St. Catherine's Isl., 18–21 September 1972, F. C. & B. J. Thompson, ♂, AMNH; 24–28 April 1972, Thomas & Picchi, ♀, AMNH. MA: Concord, 19 July 1961, W. W. Wirth, marsh, ♂, USNM. NC: Wake Co., 7 air mi. SW of Raleigh off rd., Malaise trap, C. S. Parron, 21 September 1985, ♂, NCSU; 14 August 1985, ♂, NCSU; 2 July 1985, ♀, NCSU; 30 August 1985, ♀, NCSU. NY: Kalfleisch, 15 August 1962, R. S. Huntington, ♀, USNM.





MAP 1. Distribution of *Sobarocephala affinis* (Johnson) (circle) and *S. muesebecki* Sabrosky & Steyskal (dot).

**Comments.** While the sister-species *Sobarocephala muesebecki* and *S. affinis* are both largely restricted to the eastern and southeastern coastal United States, the range of *S. muesebecki* extends further west into Texas and Pennsylvania. Males of *S. muesebecki* and *S. affinis* are easy to separate using the colour of the epandrium, but females are much more difficult to distinguish: the bristles of *S. muesebecki* are darker and the anterior margin of the frons is light yellow to white, but these characters are often difficult to see in poorly preserved specimens.

*Sobarocephala atricornis* Sabrosky & Steyskal, 1974 (Figs. 9, 30–32; Map 2)

*Sobarocephala atricornis* Sabrosky & Steyskal, 1974: 382.

#### Redescription (Fig. 9).

**Male.** Body length 3.0–3.3 mm. Bristles dark brown. Two dorsocentral bristles. Acrostichal bristle present. Two pairs of well-developed lateral scutellar bristles. Arista sparsely plumose. Sides of frons parallel. Notum yellow, usually with light to dark spot on and (usually) behind notopleuron (pigment sometimes indistinct). Pleuron and legs light yellow to white. Head largely yellow, with ocellar tubercle brown and ventral half of first

flagellomere black; parafacial and gena white and silvery tomentose. Abdomen yellow.  $M_{1+2}$  ratio 4.4. Wing clear or with cloud around apex of  $R_{2+3}$  (sometimes filling first radial cell). Cell bm open. Face flat.

**Female.** As described for male except as follows: bristles black; scutum yellow with lateral margin dark brown (sometimes faded) (one female from Ontario (DEBU) with scutum yellow excluding brownish lateral margin on notopleuron); scutellum sometimes with thin brown border along lateral margin; laterotergites brown, sometimes yellow below scutellum; face white; fore tarsi sometimes light brown; tergites 2-4 sometimes with small spot on posterior margin; tergite 6 and basal margin of tergite 7 brown; lateral stripe present along length of abdomen (not visible dorsally).

**Male terminalia.** (Figs. 30–32) Sternite 5 evenly setose. Sclerites of annulus well-developed. Width of epandrium 4/5 height and length 3/5 height. Surstylus 2/3 height of epandrium, slightly wider on distal half; tubercle-like bristles along length of posterior margin, but more concentrated apically. Cerci projecting and rounded; bristles short with several slightly longer central bristles. Ventral lobe of hypandrium long with three minute distal bristles; arm short and truncate. Phallapodeme well-developed. Pregonite ovate, membranous, and possibly fused to hypandrium. Postgonite and basiphallus small. Epiphallus long, projecting, and perpendicular to basiphallus. Distiphallus half length of phallapodeme, and lateral lobe thin, hooked, spinulose distally, and without thumb.

**Distribution.** Canada: ON, PQ. United States: KS, MA, MI, NY (Map 2).

**Holotype.** CANADA, ON: Maynooth, 8 July 1965, J. F. McAlpine, ♂, CNCI.

**Allotype.** UNITED STATES, MI: Claire Co., 23-28 July 1959, R. R. Dreisbach, ♀, USNM.

**Paratypes examined.** CANADA, ON: Ottawa, J. R. Vockeroth, 12 July 1959, ♀, CNCI; 9 July 1962, ♀, CNCI. PQ: Abbotsford, 23 June 1937, G. Shewell, ♀, CNCI. UNITED STATES, MI: Monroe Co., J. Truchan, ex. Malaise trap, 1 August 1965, ♂, USNM; 1 July 1965, ♀, USNM.

**Additional material examined.** CANADA, ON: Innisville, 12 July 1963, W. R. M. Mason, ♀, CNCI; White R., July 1980, S. A. Marshall, ♀, DEBU; Five Points, 25-30 July 1983, Malaise trap, J. Thompson, ♀, DEBU; **Wellington Co.**, University of Guelph Arboretum, ex. dung, O. Lonsdale, 9 August 2004, ♀, DEBU [in alcohol]; 19 July 2005, ♂, DEBU [in alcohol]; University of Guelph Arboretum, B. Brown, unbaited pitfalls, 22 May–8 July 1983, ♀, DEBU; mushroom baited pitfalls, 19 July 1983, 2♀, DEBU; Guelph, 11 July 1981, J. Ernst, ♀, DEBU; Fergus, Malaise trap, S. A. Marshall, 16 July 1990, 2♀, DEBU; 9 July 1990, ♀, DEBU; 10 July 1990, ♀, DEBU; Rondeau, 25 July 1981, S. A. Marshall, dung trap, ♀, DEBU; **Lambton Co.**, Port Franks, Watson Property, pans, J. Skevington, 15-18 July 1996, 5♀, DEBU; 31 July–6 August 1996, ♀, DEBU; 27 June–2 July 1996, ♀, DEBU; 18-22 July 1996, ♀, DEBU; Sault Ste. Marie, Ft. Creek Cons. Area, 8 July 1998, K. N. Barber, sweeps, *Impatiens*, sedge, fern, 46°32.5'N, 84°20.8'W, ♂, DEBU; Sault Ste. Marie, Birchwood Park, 27 July 1986, K. N. Barber, mixed forest, ♀, DEBU; **Essex Co.**,

Point Pelee N. P., Visitor Centre, Malaise trap and pans, 6-11 August 2000, O. Lonsdale, ♀, DEBU; Ottawa, J. R. Vockeroth, damp, second-growth *Acer-Betula* wood, 16 July 1989, ♂, CNCI; 4 July 1991, ♀, CNCI; 7 mi E Griffith, 11 July 1990, B. E. Cooper, ♂, CNCI; McDonald Island, St. Lawrence Isl. N. P., A. Carter, 15 July 1976, ♀, CNCI; Ottawa, 13 August 1974, J. R. Vockeroth, ♀, CNCI. **UNITED STATES, KS:** Riley Co., Manhattan, 8 July 1966, Malaise trap, G. F. Hevel, ♀, USNM. **NY:** Corlear Bay, L. Champlain, June 1939, R. C. Shannon, ♂, USNM; **Ulster Co.**, Cherrytown, 4 mi NNW Kerhonkson, 15-30 July 1971, P. & B. Wygodzinsky, ♀, AMNH.

**Comments.** *Sobarocephala atricornis* can be readily diagnosed by a ventrally black first flagellomere (hence its name). If the antennae are missing, females can be identified by their characteristic notal and abdominal patterns. Male *S. atricornis* are more difficult to identify because, like many other North American *Sobarocephala*, they are weakly pigmented and have dark bristles, however they can be distinguished by their clear wings and brown supralar spots.



MAP 2. Distribution of *Sobarocephala atricornis* Sabrosky & Steyskal.

*Sobarocephala atrifacies* Sabrosky & Steyskal, 1974 (Fig. 5; Map 3)

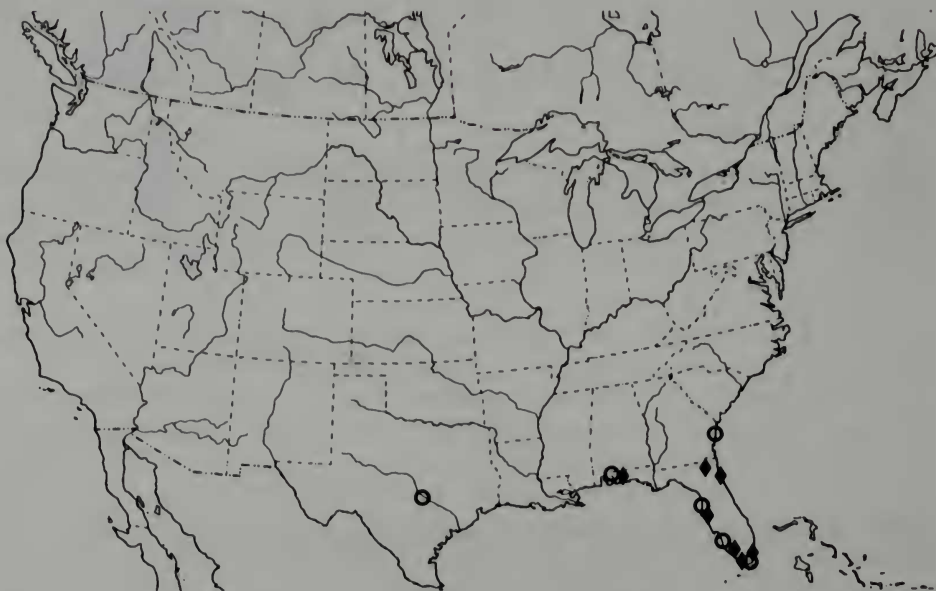
*Sobarocephala atrifacies* Sabrosky & Steyskal, 1974: 379.

**Redescription (Fig. 5)**

**Female.** Body length 3.8-4.4 mm. Bristles light brown. Two dorsocentral bristles. Acrostichal bristle present. Two pairs of well-developed lateral scutellar bristles. Arista pubescent. Sides of frons converging posteriorly. Thorax mostly yellow; notopleuron, postpronotum, scutellum, laterotergites beside scutellum and posterior notal spots white; one pair of dark brown supra-alar spots and one large posteromedial spot; if face yellow, anterior margin of scutum brown, including inner half of postpronotum. Coxae white. Legs mostly yellow, with tarsi dirty white to light brown, and fore tarsomeres 2-5 and distal 1/3 of tarsomere 1 brown. Head predominantly yellow, with parafacial and gena white, face black (yellow in some Dominican Republic specimens), and ocellar tubercle brown. Abdomen yellow with tergites 3-6 dark brown (tergites 5 and 3 yellow on anterior corner). Cerci brown.  $M_{1+2}$  ratio 3.7. Wing clear. Cell bm closed. Face flat.

**Male.** Unknown.

**Distribution.** Florida (Map 3), Dominican Republic.



MAP 3. North American distribution of *Sobarocephala atrifacies* Sabrosky & Steyskal (diamond) and *S. quadrimaculata* Soós (circle).



**Holotype.** UNITED STATES, FL: Pinellas Co., High Point, 17 November 1971, K. Hickman, ♀, USNM.

**Paratypes.** UNITED STATES, FL: Dade Co., Miami, 3 November 1971, G. R. Searis, McPhail trap in Loquat tree, 6♀, USNM.

**Other material examined.** DOMINICAN REPUBLIC. Pedernales, 26 km N Cabo Rojo, 18°06'N, 71°38'W, 730 m, 13-25 July 1990, L. Masner, J. Rawlins & C. Young, wet deciduous forest, intercept trap, 2♀, CMNH; RD-095 Rodeo, ~0.5 km E Presa de Blanco, Bonao, Monsenor Nouel Prov., 20 March 2003, D. Perez, R. Bastardo, B. Hierro, ♀, USNM.

**Comments.** The paratypes from Florida were collected on grapefruit and guava trees (Sabrosky and Steyskal 1974).

*Sobarocephala cruciger* Sabrosky & Steyskal, 1974 (Figs. 2, 24–26; Map 4)

*Sobarocephala cruciger* Sabrosky & Steyskal, 1974: 376.

**Redescription (Fig. 2)**

**Male.** Body length 3.5-5.4 mm. Bristles yellow. Two dorsocentral bristles. Acrostichal bristle absent. Two pairs of well-developed lateral scutellar bristles. Ocellar bristle absent. Arista densely plumose. Sides of frons converging posteriorly. Scutum mostly yellow; lateral margin with one pair of brown spots behind transverse suture and one pair of spots abutting scutellum; postpronotum light yellow. Scutellum brown laterally. Anatergite brown below scutellum. Pleuron and legs yellow with fore tarsi brown. Coxae white. Head mostly yellow, with gena and parafacial white, and first flagellomere brown on dorsal half; gena silvery tomentose. Tergites 1-5 with central brown stripe; posterior half of tergite 4 brown; tergite 6 with small central spot; surstylus white; remainder of abdomen yellow.  $M_{1+2}$  ratio 4.0-4.8. Wing clouded on distal 1/3. Cell bm open. Face convex on dorsal half below antennal bases.

**Female.** Externally as described for male except anatergite and tergite 6 with brown medial stripe, tergite 7 light brown, and cerci brown.

**Male terminalia.** (Figs. 24–26) Sternite 5 evenly setose. Annulus reduced to thin band ventrally. Width of epandrium 2/3 height and length half height. Surstylus short, acutely triangular, and curved inwards; tubercle-like bristles terminal only. Cerci projecting and bifid. Hypandrial arm longer and thicker than ventral lobe, projecting at 90° basally (arcuate medially); ventral lobe with one minute and two long distal bristles. Pregonite long and thin with one distal bristle. Postgonite and basiphallus small. Epiphallus thin and weakly sclerotized. Distiphallus short and bent medially; lateral lobe truncate and minutely toothed distally with thumb half length of lobe.

**Distribution.** Florida (Map 4).

**Holotype.** UNITED STATES, FL: Manatee Co., Cedar Hammock, 16 September 1966, D. C. Chancey, Steiner trap, ♂, USNM.

**Allotype.** UNITED STATES, FL: Dade Co., Miami Springs, 3 January 1972, G. R. Searls, ♀, USNM.

**Paratypes examined.** UNITED STATES, FL: Sarasota, McPhail trap, C. K. Hickman, 13 March 1972, 3♂, USNM; Bradenton, Steiner trap, D. C. Chancey, 10 September 1965, ♀, USNM; 29 July 1966, ♀, USNM; Volusia Co., S. Dayton, McPhail trap, J. N. Pott, 18 October 1966, ♂, 2♀, USNM; 5 October 1965, ♀, USNM; 10 March 1972, ♀, USNM; 14 May 1965, ♂, USNM; grapefruit tree, 29 October 1971, ♀, USNM; 12 October 1972, ♀, USNM; 10 March 1972, ♀, USNM; Allendale, McPhail trap, 3 November 1966, ♀, USNM; Volusia Co., Harbour Oakes, McPhail trap, J. N. Pott, 28 October 1966, ♀, USNM; 3 November 1966, ♀, USNM; Dade Co., Miami Springs, G. R. Searls, 3 January 1972, 3♀,



MAP 4. Map of Florida showing distribution of *Sobarocephala cruciger* Sabrosky & Steyskal.

USNM; 22 October 1971, ♀, USNM; C. F. Dawling Jr., McPhail trap, 20 February 1968, ♀, USNM; **Pinellas Co.**, High Point, McPhail trap, grapefruit tree, K. Hickman, 17 November 1971, ♀, USNM; **Sarasota Co.**, Osprey, McPhail trap, S. V. Hiatt, 24 October 1966, ♀, USNM; **Hillsborough Co.**, Tampa, McPhail trap, T. J. Flavoroso, 1 August 1968, ♀, USNM; 9 October 1967, ♀, USNM; 20 October 1969, ♀, USNM; **Manatee Co.**, Palmetto, McPhail trap, 23 September 1966, C. J. Bickner, ♀, USNM; J. R. McFarlin, McPhail trap, 8 August 1971, 2♀, USNM; McFarlin & Bickner, 9 March 1972, 2♀, USNM.

**Additional material examined. UNITED STATES, FL:** Gainesville, Doyle Conner Bldg., Malaise trap, 23 September 1973, H. V. Weems Jr., ♀, USNM; **Alachua Co.**, Pierce's Homestead, Malaise trap, W. H. Pierce, 13 October 1973, ♀, USNM.

*Sobarocephala dreisbachi* Sabrosky & Steyskal, 1974 (Figs. 14, 54–56, Map 5)

*Sobarocephala dreisbachi* Sabrosky & Steyskal, 1974: 382.

**Redescription (Fig. 14)**

**Male.** Body length 3.3 mm. Bristles brown to dark brown. Two dorsocentral bristles with one minute bristle in front of anterior dorsocentral. Acrostichal bristle absent. Two pairs of well-developed lateral scutellar bristles. Arista sparsely plumose. Sides of frons parallel. Scutum yellow, with notopleuron brown to light brown and postsutural stripes brown (broadly connected at base). Scutellum and laterotergites beside scutellum brown (sometimes also with large spot below scutellum). Pleuron and legs light yellowish-white with fore tarsi brown and anepisternum sometimes yellow. Head yellow with orange tint (sometimes darker laterally), with ocellar tubercle brown and gena light yellow and pilose. Abdomen yellow.  $M_{1+2}$  ratio 4.8. Wing lightly clouded around distal half of  $R_{2+3}$ . Cell bm open. Face flat.

**Female.** Similar to male except tergites 3–6 and posterior margin of tergite 2 brown; posterior corners of tergite 5 yellow. Females from Québec with notopleuron yellow or light brown and fore tibia brown (tip lighter).

**Male terminalia.** (Figs. 54–56) Fifth sternite with posteromedial comb. Sclerites of annulus well-developed. Epandrium slightly wider than high; length approximately 3/5 width. Surstylus as high as epandrium, with outline subtriangular and broadly rounded; tubercle-like bristles absent. Cerci sunken below distal margin of epandrium, and all bristles short. Hypandrial arm atrophied; ventral lobe with one minute distal and two long medial bristles. Phallapodeme carinate and atrophied distally. Postgonite small. Pregonite membranous with one distal setula. Basiphallus well-developed. Epiphallus long, thin, and strongly projecting from basiphallus. Distiphallus 2/5 length of phallapodeme; thumb of lateral lobe short and truncate.

**Distribution.** Canada: ON, PQ. United States: MI, NC, TN, TX (Map 5).

**Holotype.** UNITED STATES, MI: Ogemaw Co., 1–2 August 1959, R. R. Dreisbach, ♀, USNM.

**Paratypes.** CANADA, ON: Ottawa, 26 July 1959, J. R. Vockeroth, ♂, CNCI. UNITED STATES, NC: Macon Co., Wayah Gap, 3500 ft, 10 August 1957, J. G. Chillcott, ♂, CNCI.

**Additional material examined.** CANADA, ON: Algoma Dist., Hilton Twp., Hilton Beach, Malaise trap at edge of field and hardwood forest, 20 August 1992, J. E. Swann, ♀, DEBU; Bruce Co., Inverhuron P. P., back dunes, 44°17'50"N, 81°35'27"W, 20 July–20 August 2003, Malaise, S. A. Marshall, ♀, DEBU. PQ: Duncan Lk., nr. Rupert, J. F. McAlpine, 6 August 1970, ♀, CNCI; 21 July 1971, ♀, CNCI; 16 July 1971, ♀, CNCI; 27 July 1971, ♀, CNCI. UNITED STATES, TN: Union Co., 9 mi SE La Folette, 9 June 1973, A. O. Lavalley, ♀, EMUS. TX: Jasper Co., Bouton Lake Rec. Area, Angelina Nat'l Forest 11 miles SE of Zavalla, off Texas Hwy 63, 15 May 1993, I. Yarom, ♂, TAU1.

**Comments.** The genitalia of *Sobarocephala dreisbachi* are similar to those of *S. setipes* and *S. lachnosternum*, in that there is a comb of bristles on the fifth sternite and the cerci are sunken, but the surstylus is much longer.



MAP 5. Distribution of *Sobarocephala dreisbachi* Sabrosky & Steyskal.



***Sobarocephala flava* Melander & Argo, 1924 (Figs. 8, 33–35, Map 6)**

*Sobarocephala flava* Melander & Argo, 1924: 40. Sabrosky & Steyskal, 1974: 383.

*Sobarocephala populi* Steyskal, 1951: 129.

**Redescription (Fig. 8)**

**Male.** Body length 2.8–5.3 mm. Bristles dark brown to black. Two dorsocentral bristles plus one minute bristle in front of anterior dorsocentral. Acrostichal bristle present. Lateral scutellar bristles weak to well-developed. Arista sparsely plumose. Sides of frons parallel. Notum yellow with notopleuron light brown to brown and lateral margin of scutum behind notopleuron sometimes brown. Pleuron, coxae, tibiae, and basal 1/3 of femora white, with fore tarsi light brown or yellow and anepisternum sometimes light yellow. Head yellow with ocellar tubercle brown and sclerites below antenna white; gena pilose. Abdomen yellow.  $M_{1+2}$  ratio 4.0. Wing dusky along  $R_{2+3}$  and costa (more so on distal ¼); occasionally clear. Cell bm open. Face flat.

**Female.** Similar to male except as follows: notopleuron rarely yellow (yellow in holotype); face, parafacial, and gena sometimes light yellow to white; first flagellomere with light infuscation along anterior margin; tergites 6–7 brown (tergite 7 usually only pigmented anterolaterally); specimens from Mississippi with tergites 2–5 (sometimes also tergites 7 and 8) brown laterally; female from Texas mostly yellow, with notopleuron light brown, and tergites 6 and 7 dark brown anteriorly and laterally. Female from Rondeau Provincial Park (Ontario) with entire lateral margin of scutum and scutellum dark brown.

**Male terminalia.** (Figs. 33–35) Externally similar to *S. atricornis* (Figs. 30, 31) except apex of surstylus slightly broader. Internally similar to *S. atricornis* (Fig. 32) except as follows: pregonite clavate with five bristles along length; only two hypandrial bristles usually present; lateral lobe strongly bent medially with thumb short, pointed, and projecting at 90°.

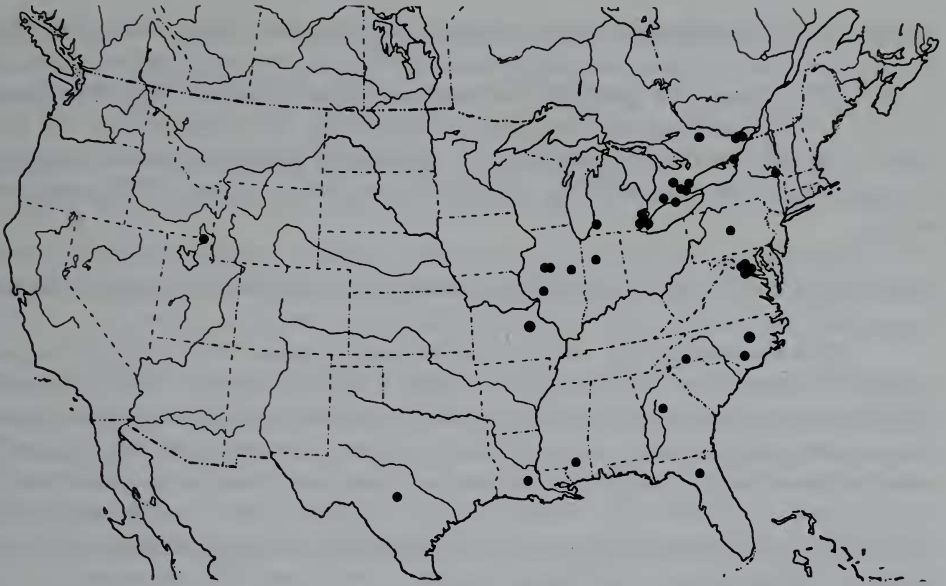
**Distribution.** Canada: ON. United States: FL, GA, IL, IN, LA, MD, MI, MO, MS, NC, NY, PA, TX, UT, VA (Map 6).

**Holotype.** UNITED STATES, VA: Fairfax Co., Dead Run, ISS 15 April [year unknown], ♀, USNM.

**Paratypes examined.** UNITED STATES, LA: Opelousas, April 1917, ♀, USNM. MI: Plummer Isl., 29 June 1913, ♀, USNM. VA: Dead Run, R. C. Shannon, 15 July 1915, 3♀, USNM; ex. Maple log, 13 March 1915, ISS 19 April 1915, ♀, USNM; 11 July 1915, ♀, USNM; Falls Church, N. Banks, June 1920, ♀, USNM; 4 July 1913, F. Knab, ♀, USNM.

**Additional material examined.** CANADA, ON: 7 mi E Griffith, 1 July 1990, B. E. Cooper, 2♀, CNCI; Hamilton, 13–19 July 1980, Malaise trap, M. Sandborne, 2♀, DEBU; Burlington, Royal Bot. Gardens, 16 July 1997, K. N. Barber, sweeps, trail-side *Poa*, *Agrostis*, *Phleum*, *Festuca*, *Juncus*, 43°17.5'N, 79°52.4'W, ♀, DEBU; Burlington, Bronte Crk. Prov. Pk., 17–20 August 1983, Brown & Marshall, Malaise trap, ♀, DEBU; Dundas, May 1980, E. A. Menard, reared, larva in dead Elm, ♀, DEBU; Algonquin Prov. Pk., Swan Lk. Res. Sta.,

reared from rothole in dead Maple tree, emerged 30 May 1995, D. C. Caloren, ♀, DEBU; Five Points, 29-30 July 1983, J. G. Thompson, ♀, DEBU; Fergus (yard), 9 August 1985, S. A. Marshall, floodplain, Malaise trap, ♀, DEBU; Fergus, Malaise trap, S. A. Marshall 8-14 June 1982, ♀, DEBU; 16 July 1990, ♀, DEBU; Port Credit, 15 July 1918, M. C. Van Duzee, ♀, CASC; Bells Corners, E. C. Becker, 31 May 1954, reared from under Beech, ♀, USNM; 21 June 1954, reared ex. puparia on rotten log, ♂, USNM; Bells Corners, reared ex. puparia on rotten log, 21 June 1954, E. C. Becker, 5♂, 6♀, CNCI; Ottawa, J. R. Vockeroth, damp second-growth *Acer-Betula* wood, 4 July 1991, 3♀, CNCI; 2 July 1992, 2♀, CNCI; 11 July 1989, ♀, CNCI; 13 August 1991, 2♀, CNCI; 6 July 1991, ♀, CNCI; 28 July 1991, ♀, CNCI; 9 August 1992, ♀, CNCI; McDonald Isl., St. Lawrence Isl. N. P., A. Carter, Malaise trap, 19 July 1976, ♀, CNCI; 20 July 1976, ♀, CNCI; 5 August 1976, ♀, CNCI; Metcalfe, B. E. Cooper, 24 July 1984, 2♀, CNCI; 22 July 1984, ♀, CNCI; 4 August 1984, ♀, CNCI; 1 August 1984, ♀, CNCI; **Essex Co.**, Point Pelee, 18 July 1978, J. M. Cumming, ♀, DEBU; Windsor, Ojibway Prairie, S. Paiero unburnt forest, yellow pans, 3-6 July 2001, ♀, DEBU; 31 July-3 August 2001, ♀, DEBU; burnt savannah, yellow pans, 25-29 June 2001, ♀, DEBU; **Kent Co.**, Rondeau P. P., Spicebush Trail, 42°18'09"N, 81°51'06"W, Carolinian forest, Malaise, 16-29 July 2003, S. A. Marshall, 2♀, DEBU. **UNITED STATES, FL:** Gainesville, Pine Hill Estates, 4 October 1973, H. V. Weems Jr., Malaise trap, ♀, USNM. **GA:** Forsyth, 2 June 1970, 2♀, CNCI. **IL:** **Champaign Co.**, Brownfield Woods, 2 mi NE Urbana, 29 June 1976, C. T. Maier, ♀, EMUS; **Mason Co.**, Sandridge St. Forest, 4 mi NW Forrest City, 23 June 1976, C. T. Maier, ♀, EMUS; **Tazewell Co.**, 3 mi N Macking along Panther Cr., Webb & Marlin, 10 June 1969, ♂, EMUS; Carlinville, 9 May 1952, M. R. Wheeler, ♂, AMNH. **IN:** La Fayette, 8 July 1916, ♂, USNM; July 1912, ♂, USNM; J. M. Aldrich, 3 July 1915, ♀, USNM; August 1914, ♂, USNM; July 1921, ♂, USNM. **MD:** Plummers Isl., 11 July 1915, R. C. Shannon, ♀, USNM; Colesville, W. W. Wirth, 11 July 1974, 4♀, USNM; 4 July 1976, ♀, USNM; 18 June 1977, 2♀, USNM; 14 June 1977, ♀, USNM; 28 July 1976, ♀, USNM; **Montg'y Co.**, Colesville, W. W. Wirth, Malaise trap, 30 June 1977, ♂, USNM; 26 June 1977, ♂, 2♀, USNM; Montg'y Co., Dickerson, G. A. Foster, 14 July 1974, 2♂, USNM; Montg'y Co., Rockville, W. W. Wirth, Malaise trap, 4 September 1977, ♀, USNM; 3 August 1979, ♂, USNM; 26 July 1979, ♀, USNM; Montg'y Co., Chevy Chase "woodend", 3 August 1974, G. F. Hevel, ♀, USNM; **Prince Georges Co.**, Patuxent Wildlife Res. Centre, W. W. Wirth, 8 July 1978, ♀, USNM; J. F. Reinert 31 July 1977, ♀, USNM; Glen Echo, J. R. Malloch, 23 July 1921, ♀, USNM; Laurel, 11 June 1965, marsh edge, 3♀, CNCI; Prince George Co., Beltsville, 15 July 1979, A. Freidberg, ♀, TAUI. **MI:** Grosse Ile, 30 June 1949, G. Steyskal, ♀, USNM; **Berrien Co.**, St. Joseph, D. D. Wilder, 14 July 1971, ♀, USNM; **Monroe Co.**, 20 July 1965, J. Truchan, ex. Malaise trap, ♂, USNM; **Wayne Co.**, Grosse Isle, G. C. Steyskal, 1 July 1949, ♀, USNM; 14 June 1949, ♀, USNM; 4 June 1962, ♀, USNM; 4 August 1956, 2♀, USNM; 3 August 1951, 2♀, USNM; 7 August 1951, ♀, USNM; 8 August 1956, ♀, USNM; 22 June 1949, ♀, USNM; 24 July 1951, 6♀, USNM. **MO:** Columbia, Malaise trap, 24 June 1967, 4pm-7am, F. D. Parker, ♀, USNM. **MS:** **Forrest Co.**, 6 mi W Wiggins, Sweet Bay Bog, dung trap, 5-8 May 1994, sphagnum, S. A. Marshall, 3♀, DEBU. **NC:** **Columbus Co.**, Lk. Waccamaw, 6 July 1985, W. Stein & A. Gerberich, blacklight in Oak & Pine scrub sand barriers nr lake, ♀, USNM; **Bladen Co.**, Singletary Lk. St. Pk., 34°35'0N, 78°27'30W, Malaise, 19-22 May 2003, Marshall & Paiero, ♀, DEBU; **Wake Co.**, 7 air mi SW of Raleigh off rd., 1 September 1985, C. S.



MAP 6. Distribution of *Sobarocephala flava* Melander & Argo.

Parron, Malaise trap, ♀, NCSU; Raleigh, late July, F. Sherman, ♀, NCSU. **NY:** Brainard, Rensselaer Co., 11-22 July 1966, P. & B. Wygosinsky, ♀, AMNH. **PA:** State College, Centre Co., 4 July 1972, D. J. Shetlar, ♀, CASC. **TX:** Kerrville, 23 April 1959, Becker & Howden, ♀, CNCI. **UT:** Garden City, 15 July 1951, F. C. Harmaton, ♀, USNM. **VA:** Alexandria, 24 June 1951, W. W. Wirth, ♂, USNM; St. Falls, 9 July 1926, A. L. Melander, ♀, USNM; Falls Church, Holmes Run, 6 August 1960, light trap, ♂, USNM; Dead Run, 28 July 1915, ♀, USNM; 29 June 1915, ♀, USNM; R. C. Shannon, 15 July 1915, ♀, USNM; 28 July 1915, ♀, USNM; Scott Run, July 1954, M. R. Wheeler ♂, ♀, USNM; Marina National Airport, 28 August 1994, A. Freidberg, ♀, TAUI.

**Comments.** *Sobarocephala flava* is a commonly collected species throughout much of eastern North America; specimens have also been collected in central Texas and Utah.

***Sobarocephala flaviseta* (Johnson, 1913) (Figs. 3, 18–20; Map 7)**

*Heteromeringia flaviseta* Johnson, 1913: 99.

*Heteromeringia convergens* Malloch, 1922: 50.

*Sobarocephala flaviseta*, Sabrosky & Steyskal 1974: 380.

**Redescription (Fig. 3)**

**Male.** Body length 3.0-5.0 mm. Bristles brown. Two dorsocentral bristles plus one minute bristle in front of anterior dorsocentral. Acrostichal bristle present. Two pairs of

well-developed lateral scutellar bristles. Arista sparsely plumose. Sides of frons converging posteriorly. Scutum yellow with postpronotum and notopleuron white (at least centrally). Pleuron light yellow. Legs light yellow with coxae and base of femora white. Head yellow to white, with ocellar tubercle brown, and with parafacial, gena, sides of face, and scape white. Abdomen yellow.  $M_{1+2}$  ratio 3.1-3.3. Wing clear (sometimes clouded distally in first radial cell). Cell  $bm$  closed. Face, parafacial, and anterior margin of frons uniformly bulging.

**Female.** As described for male except as follows: tergite 3 with faded central stripe; tergites 4 and 5 light brown with anterior-lateral corners widely yellow; abdominal pattern sometimes reduced to central stripe on tergite 5. Cercus light brown.

**Male terminalia** (Figs. 18–20). Sternite 5 evenly setose. Sclerites of annulus well-developed. Epandrium as wide as high and length  $3/4$  height. Surstylus short, acute, and curved inwards; tubercle-like bristles distal only. Cerci projecting and slightly emarginate with one pair of slightly longer central bristles. Hypandrial arm stout and projecting at  $90^\circ$ ; ventral lobe thin, slightly longer than arm, and with one minute and two long distal bristles. Phallapodeme well-developed and slightly sinuate. Pregonite narrow basally, wide distally and with five apical bristles. Postgonite absent. Distiphallus  $3/4$  length of phallapodeme and curved at base; lateral lobe wide, truncate, minutely serrate, and with long thumb.



MAP 7. Distribution of *Sobarocephala flaviseta* (Johnson).



**Distribution.** NB, ON, PQ and eastern U.S. to BC, AB, ID, CO, and TX (Map 7).

**Holotype.** UNITED STATES, NJ: New Brunswick, 28 May, J. B. Smith, ♀, MCZC.

**Paratypes examined.** UNITED STATES, IN: Lafayette, July 1927, ♀, USNM. VA: Chainbridge, 20 August 22, J. R. Malloch, ♀, USNM. NJ: same collection as holotype, ♀, MCZC.

**Additional material examined.** 19♂, 198♀ [AMNH, CNCI, DEBU, TAMU, TAUI, USNM].

**Comments.** *Sobarocephala latifrons* and *S. flaviseta* are two of the most commonly encountered *Sobarocephala* in northeastern North America, although neither is as frequently collected as species of *Clusia* or *Clusiodes*. *Sobarocephala flaviseta* is common in eastern North America, and it has been occasionally collected in Texas and the northwest (Sabrosky and Steyskal 1974).

The apparent female-biased sex ratio of over 10:1 is unusual, although females of other species are generally more often collected than males. We suspect that this apparent female-biased sex ratio is a collecting artifact, and is more likely to reflect the clumping of males at mating sites than a population-level ratio. Too few reared specimens are available to assess actual sex ratios of any clusiid species.

*Sobarocephala interrupta* Sabrosky & Steyskal, 1974 (Figs. 13, 51–53; Map 8)

*Sobarocephala interrupta* Sabrosky & Steyskal, 1974: 384.

### Redescription (Fig. 13)

**Male.** Body length 4.5 mm. Bristles light brown. Two dorsocentral bristles. Acrostichal bristle present. Arista sparsely plumose. Anterior lateral scutellar bristle minute or absent. Sides of frons parallel. Notum yellow, with notopleuron brown, scutum with one pair of basal spots (often serrate), and lateral margin of scutellum brown. Pleuron and legs light yellow with fore tarsi brown; Mississippi specimens with pleuron and basal half of femora white. Head yellow, with gena and parafacial dirty white to white, ventral margin of face sometimes orange, and ocellar tubercle brown; gena pilose. Abdomen yellow with tergites 2–5 brown (excluding anterior corners).  $M_{1+2}$  ratio 3.6–5.5. Wing clear. Cell bm open.

**Female.** Similar to male except tergites 3 and 4 brown and tergite 6 with posterior margin light brown centrally. Scutellum entirely yellow in South Carolina paratype.

**Male terminalia.** (Figs. 51–53) Sternite 5 evenly setose. Sclerites of annulus well-developed. Epandrium as high as wide and length half height. Surstylus bifid with anterior lobe well bristled and posterior lobe sparsely setose with small conical tubercle-like bristles; lobes subequal in length. Cerci concave medially, flush with distal margin of epandrium, and with all bristles short. Hypandrial arm very short; ventral lobe with one minute distal and two long medial bristles. Phallapodeme thinned medially, wide and

truncate distally, and not extending past dorsal margin of hypandrium. Pregonite large and circular with four medial bristles. Postgonite thin and flat with four bristles. Basiphallus well-developed. Epiphallus small and well-sclerotized. Distiphallus nearly half length of phallapodeme; lateral lobe small and finger-like with thumb absent.

**Distribution.** United States: FL, GA, IL, LA, MS, SC, TX (Map 8).

**Holotype.** UNITED STATES, FL: Orange Co., Rock Springs, 21 April 1970, W. W. Wirth, ♂, USNM.

**Allotype.** UNITED STATES, FL: Alachua Co., Chantilly Acres, 25 April 1970, W. W. Wirth, Malaise trap, ♀, USNM.

**Paratypes examined.** UNITED STATES, LA: Kilbourne, 3 May 1959, W. W. Wirth, ♀, USNM. SC: Greenwood, Long Cane Lake, 21 July 1957, W. R. Richards, ♀, CNCI.

**Additional material examined.** UNITED STATES, FL: Gainesville, Doyle Conner Bldg., H. V. Weems Jr., Malaise trap, 16 October 1973, ♀, USNM; 8-9 September 1973, ♀, USNM; Highlands Hammock St. Pk., H. V. Weems Jr., 15 July 1956, ♀, USNM. GA:



MAP 8. Distribution of *Sobarocephala interrupta* Sabrosky & Steyskal (dot) and *S. texensis* Sabrosky & Steyskal (circle).

**Liberty Co.**, St. Catherine's Isl., 18-21 September 1972, F. C. & B. J. Thompson, ♂, AMNH. **IL: Champaign Co.**, Brownfield Woods, 2 mi NE Urbana, 29 June 1976, C. T. Maier, ♀, EMUS. **MS: Forrest Co.**, 6 mi W Wiggins, Sweet Bay Bog, 5-8 May 1994, sphagnum, dung trap, S. A. Marshall, ♂ 3♀, DEBU. **SC: Georgetown Co.**, Hobcaw Barony, Belle Baruch Marine Field Lab, on slime mold, May 2004, S. A. Marshall, ♀, DEBU [in alcohol]. **TX: Montg. Co.**, Jones St. Forest, 8 mi S Conroe, 28 June–13 July 1987, Wharton, Steck, Carroll, ♂, TAMU; 1-7 June 1987, Wang, Wharton, Praetorius, Malaise trap, ♀, TAMU.

**Comments.** The medially yellow scutellum, characteristic notal stripes, and bifid surstylus most readily diagnose *Sobarocephala interrupta*.

***Sobarocephala lachnosternum* Melander & Argo, 1924** (Figs. 16, 62–64; Map 9)

*Sobarocephala lachnosternum* Melander & Argo, 1924: 42. Sabrosky & Steyskal, 1974: 382.

**Redescription (Fig. 16)**

**Male.** Body length 3.9-4.9 mm. Bristles dark brown. Two dorsocentral bristles plus one minute bristle in front of anterior dorsocentral. Acrostichal bristle present. Two pairs of well-developed lateral scutellar bristles. Arista sparsely plumose. Sides of frons parallel. Scutum yellow with notopleuron dark brown (notopleuron sometimes faded, often in newly emerged adults). Scutellum and laterotergites yellow, although anatergite sometimes with one pair of light brown stripes lateral to scutellum. Pleuron light yellow to white excluding yellow anepisternum and katepisternum. Coxae white. Legs yellow with fore tarsi brown. Head yellow with parafacial and occiput white, gena white and silvery tomentose, ocellar tubercle brown, and anterior margin of frons with dirty yellow tint continuing onto dorsal margin of face. Abdomen light yellow, occasionally with light brown to brown bands on posterior margin of tergites 3-5 (faded medially).  $M_{1+2}$  ratio 3.1-3.5. Wing clear. Cell bm open. Face flat.

**Female.** Similar to male except as follows: posterior margin of tergite 2 sometimes brown; tergites 3 and 4 brown with anterior corners yellow; tergite 5 brown centrally and on posterior margin (sometimes reduced to light posterior spot); tergite 6 dark brown; remainder of abdomen yellow; pedicel brown in one female (Maryland).

**Male terminalia.** (Figs. 62–64) Sternite five with comb of bristles on posteromedial margin. Sclerites of annulus well-developed. Epandrium large and barrel-shaped (as wide and high as pre-genitalic abdominal segments). Surstylus small and broadly rounded; tubercle-like bristles absent. Cerci small, rounded, slightly projecting, and with all bristles short. Ventral lobe of hypandrium elongate and poorly-defined with three minute bristles. Phallapodeme elongate and well-developed. Basiphallus well-developed. Epiphallus small. Postgonite large and ovate with several minute setulae. Pregonite absent. Distiphallus very short and curved; lateral lobe ovate.

**Distribution.** Canada: ON, PQ, SK. United States: IL, IN, KS, MD, MI, NC, TX, UT, VA (Map 9).

**Holotype.** UNITED STATES, VA: Rosslyn, R. C. Shannon, found larva 25 November 1912, ♂, USNM.

**Paratypes.** UNITED STATES, VA: Rosslyn, R. C. Shannon, found larva 25 November 1912, ISS 10 January 1913, ♂, USNM; bred specimen coll. 25 November 1912, ISS 26 January 1913, ♀, USNM; bred specimen coll. 25 November 1912, ISS 24 January 1913, ♂, USNM; ex. rotten log, 2 May 1913, ISS 20 May 1913, ♀, USNM; ex. rotten log, 2 May 1913, ISS 17 May 1913, ♂, USNM.

**Additional material examined.** CANADA, ON: Fergus, 10 July 1990, Malaise trap, S. A. Marshall, ♀, DEBU; Guelph, 21 July 1978, W. Ralley, ♀, DEBU; Dundas, 29 June 1981, J. Kircher, ♀, DEBU; Algonquin Prov. Pk., Swan Lk. Survey, 45°29'15"N, 78°43'20"W, Malaise trap, hemlock/hardwood, 16-28 July 1993, Larson, Marshall & Barr, ♀, DEBU; Shakwa Lk., Oulette Twp., 21 July 1996, A. Applejohn, ♀, DEBU; Hamilton, 19-28 August 1980, M. Sandborne, Malaise trap, ♀, DEBU; **Elgin Co.**, Springwater Cons. Area, 24 June 1996, D. C. Caloren, ♀, DEBU; **Bruce Co.**, Dunk's Bay, Malaise trap, S. A. Marshall, 17 July–18 August 1996, ♀, DEBU; Icewater Crk., 12.7 km NNE Searchmont, mi10.5 Whitmore Dam Rd., 24 June 1986, K. N. Barber, mixed forest, ♂, DEBU; [Nippising] Hwy#17, 7 km W Mattawa, 12 June–2 July 2004, opaque mini sticky traps, mixed forest, 46°17.3'N, 78°49.0'W, K. N. Barber, ♀, DEBU; Windsor, Malaise trap, S. A. Marshall, 7-16 August 1982, ♀, DEBU; Sault Ste. Marie, Bristol Pl. Pk., 2 July 2001, K. N. Barber, sweeps, mostly sedges, 46°30.8'N, 84°16.6'W, ♀, DEBU; 40 km SSW White River, K. N. Barber, boreal mixedwood, Malaise trap, 48°14.08'N, 85°22.02'W, 7-22 July 2003, ♀, DEBU; multi-colour sticky trap, 48°14.05'N, 85°21.97'W, 10-23 July 2003, ♂, 3♀, DEBU; 16-26 June 2003, ♂, DEBU; 48°14.14'N, 85°22.02'W, 26 June–10 July 2003, 7♂, 6♀, DEBU; Ottawa, 24 July 1972, J. R. Vockeroth, damp secondary growth *Acer-Betula* wood, ♀, CNCI; Innisville, 12 July 1963, W. R. M. Mason, ♀, CNCI; 7 mi E Griffith, 5 July 1990, B. E. Cooper, ♀, CNCI. **PQ:** Gatineau, King Mtn., S. A. Marshall; 23 August 1977, ♂, DEBU; Kirk's Ferry, 23 August 1924, G. S. Walley, ♂, CNCI; Duncan Lk. Nr. Rupert, J. F. McAlpine, 20 July 1969, ♀, CNCI; 28 July 1971, ♀, CNCI; 24 July 1971, ♀, CNCI. **SK:** Beaver Crk. Cons. Area, ~13 km S Saskatoon, 12 July 1999, K. N. Barber, sweeps, mostly grasses under *Betula/Populus*, 51°58.6'N, 106°43'W, 3♀, DEBU. **UNITED STATES, IL:** Tazewell Co., 3 mi N Mackinaw along Panther Crk., Webb & Marlin, 10 June 1969, 2♂, EMUS. **IN:** Posey Co., Harmonie St. Pk., 24-26 June 1998, Wharton et al., ♀, DEBU. **KS:** Pottawatomie Co., 12 mi W Wamego, 24 July 1966, G. F. Hevel, ♀, USNM. **MD:** Montg'y Co., Colesville, W. W. Wirth, Malaise trap, 26 June 1977, ♀, USNM; 15 August 1975, ♀, USNM; Colesville, W. W. Wirth, 6 August 1976, ♀, USNM; 28 July 1976, 2♀, USNM; Malaise trap, 13 August 1977, ♀, USNM; Montg'y Co., Bethesda, G. C. Steyskal, 9 August 1972, 2♀, USNM; Laurel, 11 June 1965, marsh edge, ♂, CNCI. **ME:** Dryden, 7 July 1959, G. H. Heinrich, ♀, CNCI. **MI:** Wayne Co., Grosse Isle, G. C. Steyskal, 8 August 1956, ♀, USNM; 15 June 1949, ♀, USNM; 4 August 1956, ♀, USNM; 23 June 1956, ♂, USNM; 19 June 1955, ♂, USNM; **Monroe Co.**, 26 July 1956, J. Truchan, ex. Malaise trap, ♂, USNM. **NC:** Wake Co., 7 air mi SW of Raleigh off rd., 25 July 1985, C. S. Parron, Malaise trap, ♀, NCSU. **TX:** Salmon, **Anderson Co.**, 6-19 October 1974, H. R. Burke, ♀, TAMU. **UT:** Utah Co., Provo, Malaise trap, 6-9 July 1985, ♂, ♀, EMUS; 16-23





MAP 9. Distribution of *Sobarocephala lachnosternum* Melander & Argo.

July 1985, 2♀, EMUS; 20-27 July 1985, ♀, EMUS; 7-14 August 1985, 3♀, EMUS; 14-21 August 1985, ♀, EMUS; 6-16 July 1985, 3♀, EMUS; 18-26 June 1985, ♂, 14♀, EMUS; 25 June–6 July 1985, 11♀, EMUS. VA: Warsaw, 26 July 1952, W. W. Wirth, ♀, USNM.

**Comments.** While male *Sobarocephala lachnosternum* superficially resemble other pale North American *Sobarocephala*, they can be readily identified by a large barrel-shaped epandrium and small surstyli. Females can be identified by their characteristic abdominal pattern.

See comments for *Sobarocephala setipes*.

***Sobarocephala latifacies* Sabrosky & Steyskal, 1974 (Figs. 4, 21–23; Map 10)**

*Sobarocephala latifacies* Sabrosky & Steyskal, 1974: 380.

**Redescription (Fig. 4)**

**Male.** Body length 3.0-5.6 mm. Bristles black. Two dorsocentral bristles plus one minute bristle in front of anterior dorsocentral. Acrostichal bristle present. Two pairs of well-developed lateral scutellar bristles. Arista short-plumose. Sides of frons converging posteriorly. Notum predominantly yellow with notopleuron brown to dark brown; scutum sometimes brown on lateral margin and laterotergites yellow or brown. Pleuron light yellow. Coxae white. Legs yellow with fore tarsi light brown (at least apically). Head yellow with gena and parafacial white, face light yellow and ocellar tubercle brown. Abdomen yellow.

$M_{1+2}$  ratio approximately 3.0. Wing clouded in cell  $R_1$ , around distal 1/5 of  $R_{4+5}$ , and around  $R_{2+3}$ . Cell bm open. Face, parafacial, and anterior margin of frons uniformly bulging.

**Female.** Scutum as described for male. Abdomen yellow with tergites 6 and 7 brown and tergites 2-5 with small spot on anteromedial margin (tergites 2-5 sometimes with light brown medial stripe and light brown border, or only with posterior margins brown).

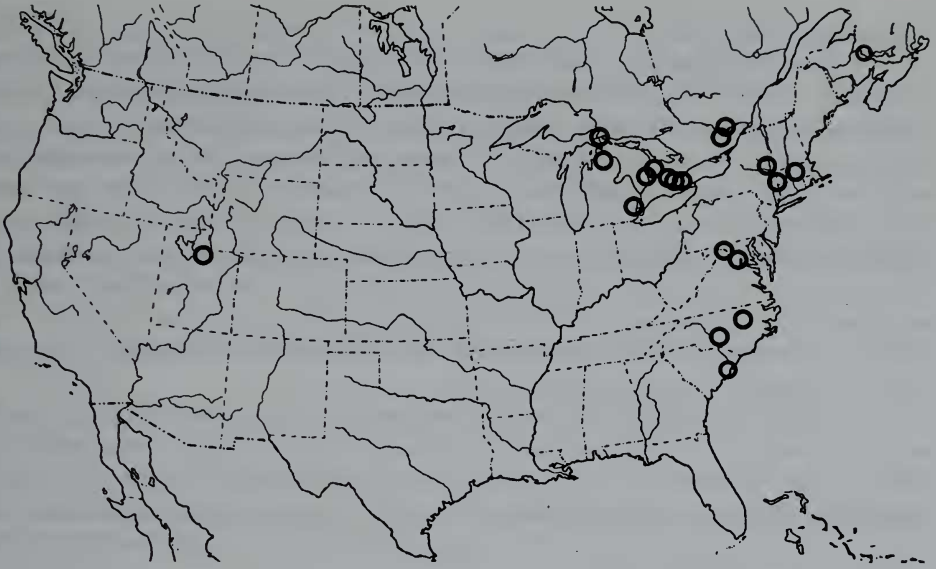
**Male terminalia.** (Figs. 21–23) Sternite 5 evenly setose. Sclerites of annulus well-developed. Epandrium as wide as long and almost as high as wide. Surstylus short, rounded, thick, and slightly pointed apically; tubercle-like bristles along entire length of apical and posterior margins, somewhat encroaching upon posterior surface. Cerci projecting, somewhat emarginate and with one pair of longer central bristles. Hypandrial arm curved, widest distally, as long as ventral lobe and projecting at 60–70° basally; lobe with one minute and two long distal bristles. Phallapodeme long and relatively thin. Pregonite long, tapered at both ends and with five medial bristles. Postgonite minute. Basiphallus large with epiphallus at tip. Distiphallus approximately 2/3 length of phallapodeme and bent at midpoint; lateral lobe well-developed, curved, and toothed distally; thumb well-developed.

**Distribution.** Canada: NB, ON, PQ. United States: MA, MI, NC, NH, NY, SC, UT (northeastern North America and Utah) (Map 10).

**Holotype.** UNITED STATES, MI: Grosse Ile, Wayne Co., 29 August 1948, G. Steyskal, ♂, USNM.

**Paratypes examined.** CANADA, ON: Bells Corners, ex. Rotten log, 21 June 1954, E. C. Becker, 2♂, ♀, USNM; Bells Corners, 12 June 1954, E. C. Becker, reared ex. puparia on rotten log, 2♂, 2♀, CNCI; Burke Falls, 13 July 1926, F. P. Ide, ♀, CNCI; nr. Picton, 9 July 1970, J. F. McAlpine, ♀, CNCI. PQ: Hull, 10 August 1965, ex. Malaise trap, ♀, CNCI; Laniel, 28 July 1933, ♀, CNCI; Duncan Lk. Nr. Rupert, 1 August 1969, J. F. McAlpine, ♀, CNCI. UNITED STATES. White Mts., Morrison, ♂, USNM.

**Additional material examined.** CANADA, ON: Tenby Bay, Malaise at lake edge, 19 July 1992, ♀, DEBU; Hamilton, 10–13 July 1980, Malaise trap, M. Sandborne, ♂, 3♀, DEBU; Dundas, E. A. Menard, 27 June 1980, ♂, 2♀, DEBU; 13 June 1980, ♂, ♀, DEBU; 17 June 1980, ♂, ♀, DEBU; 1 July 1980, 2♂, DEBU; 23 June 1980, ♀, DEBU; 8 July 1980, ♂, DEBU; 15 July 1980, ♂, DEBU; reared in dead Elm, May 1980, ♂, DEBU; Dornoch, fen, 20 July 1996, S. A. Marshall, ♂, DEBU; Port Franks, Watson property nr. lake, pans, 8–12 July 1996, J. Skevington, ♀, DEBU; Sault Ste. Marie, Bristol Pl. Pk., sweeps, mostly *Impatiens*, *Clematis*, *Rubus*, grasses, 46°30.8'N, 84°16.6'W, 11 June 1999, K. N. Barber, ♀, DEBU; Fergus, Malaise trap, S. A. Marshall, 5 July 1990, ♀, DEBU; 4 August 1990, ♀, DEBU; 9 July 1990, ♀, DEBU; (yard) flood plain, Malaise trap, 27 June 1985, S. A. Marshall, ♀, DEBU; Guelph, K. N. Barber, 11 July 1979, ♀, DEBU; 9 July 1979, ♀, DEBU; pan traps, 5–18 July 1980, 2♀, DEBU; Brown & Marshall, University of Guelph Arboretum, Malaise head, 28 June–4 July 1983, ♀, DEBU; Arkell, E. A. Innes, 7 May 1979, ♀, DEBU; 7 May 1979, (emerged 22 May 1979), ♀, DEBU; 8 May 1979 (emerged 22–30 May 1979), 41♂, 22♀, DEBU. UNITED STATES, MD: Colesville, W. W. Wirth, 4 July 1976, ♀, USNM; 11



MAP 10. Distribution of *Sobarocephala latifacies* Sabrosky & Steyskal.

July 1974, ♂, USNM; 18 June 1977, ♂, USNM; **Montgomery Co.**, Carderock Pk., 13 June 1970, L. V. Knutson, ♀, USNM; **Prince Georges Co.**, Patuxent Wildlife Res. Centre, W. W. Wirth, 14 July 1978, ♀, USNM. **MI: Wayne Co.**, Grosse Ile, 30 June 1949, G. Steyskal, 2♀, USNM. **NC: Cumberland Co.**, Ft. Bragg, 28 May–3 June 1967, J. D. Birchim, ♀, CASC; **Wake Co.**, 7 air mi SW of Raleigh off rd., 30 August 1985, C. S. Parron, Malaise trap, ♂, NCSU. **NY: Rensselaer Co.**, 11–22 July 1966, P. & B. Wygodzinsky, ♀, AMNH. **SC: Georgetown Co.**, Hobcaw Barony, Belle Baruch Marine Field Lab, on slime mold, May 2004, S. A. Marshall, ♀, DEBU [in alcohol]. **UT: Summit Co.**, Coalville, 1710 m, 30 July 1973, P. H. Arnaud Jr., ♀, CASC.

**Comments.** The abdominal pattern of the female is characteristic, but the male abdomen is entirely yellow, similar to that of several other North American species. Males can be best diagnosed by a frons that narrows posteriorly, an absence of white shoulder patches, and an open cell bm.

***Sobarocephala latifrons* (Loew, 1860) (Figs. 10, 48–50; Map 11)**

*Heteroneura latifrons* Loew, 1860: 82.

*Heteromerina latifrons*, Johnson, 1913: 99. Malloch, 1918: 8.

*Sobarocephala latifrons*, Melander & Argo, 1924: 42. Sabrosky & Steyskal, 1974: 381.

**Redescription (Fig. 10)**

**Male.** Body length 3.3-4.5 mm. Bristles black. Two dorsocentral bristles plus one minute bristle in front of anterior dorsocentral. Acrostichal bristle present. Small, weak presutural intra-alar bristle sometimes present. Lateral scutellar bristles weak. Arista sparsely plumose. Sides of frons parallel. Scutum predominantly yellow with notopleuron brown and lateral margin behind suture light brown. Scutellum yellow with median brown stripe (darkest apically and sometimes faded basally). Laterotergites sometimes light brown lateral to scutellum. Pleuron and legs white with fore tarsi light brown. Head predominantly yellow, with face light yellow, ocellar spot large and triangular, and mouthparts, parafacial and gena white; gena pilose. Abdomen light yellow, often light brown on tergite 5 and laterally on tergites 2-4, and sometimes with small spot at base of epandrium.  $M_{1+2}$  ratio 3.8-4.4. Wing clear. Cell bm open. Face flat.

**Female.** Similar to male except as follows: lateral brown margin on scutum wider; fore tarsi brown; scutellar stripe and lateral stripes on laterotergites strong and always present; laterotergites with thin stripe below scutellum; tergites 2-4 brown laterally, medially, on posterior margin and laterally on anterior margin; tergite 5 sometimes with wide median stripe (tapering anteriorly); tergite 6 and anterior margin of tergite 7 brown; wing dusky along anterior margin.

**Male terminalia.** (Figs. 48-50) Sternite 5 evenly setose. Sclerites of annulus well-developed. Epandrium as wide as high and length 4/5 height. Surstylus 4/5 height of epandrium and with rounded emargination from midpoint of posterior margin to apex



MAP 11. Distribution of *Sobarocephala latifrons* (Loew) (dot), *S. wirthi* spec. nov. (circle) and *S. pengellyi* spec. nov.



(appearing “hook-like”); tubercle-like bristles along posterior and apical margins. Cerci small and rounded with one slightly longer central bristle. Hypandrial lobe with three short distal bristles. Phallapodeme and postgonite well-developed. Pregonite elongate and ovate with four basal bristles, and with thin elongate projection on inner-medial surface. Basiphallus and epiphallus small. Distiphallus  $2/3$  length of phallapodeme; thumb and lateral lobe well-developed with lobe half length of distiphallus.

**Distribution.** Canada: ON, PQ. United States: DC, GA, IL, MA, MD, MI, NC, NJ, NY, PA, TX, VA, WV (Map 11).

**Holotype.** UNITED STATES, DC: “Osten Sacken”, ♀, location unknown.

**Paratype.** UNITED STATES, VA: Fairfax Co., Dead Run, 22 June 1915, R. C. Shannon, ♂, USNM.

**Additional material examined.** 103♂, 153♀ AMNH, [CASC, CNCI, DEBU, EMUS, TAMU, TAU, USNM].

**Comments.** *Sobarocephala latifrons* is a commonly collected species in northeastern North America south of Ottawa and east of the Mississippi. Specimens have also been found in North Carolina, Georgia, and Texas. The only similar species with an overlapping range is the closely related *S. wirthi*, which is more southeastern in distribution. Males of these two species are distinct (see couplet 13), but females are more difficult to separate.

*Sobarocephala muesebecki* Sabrosky & Steyskal, 1974 (Figs. 7, 36–38; Map 1)

*Sobarocephala muesebecki* Sabrosky & Steyskal, 1974: 378.

**Redescription (Fig. 7)**

**Male.** Body length 2.6–4.1 mm. Bristles brown. Two dorsocentral bristles plus one minute bristle in front of anterior dorsocentral. Acrostichal bristle absent. Two pairs of well-developed lateral scutellar bristles. Arista densely plumose. Sides of frons parallel. Body yellow with fore tibia and tarsi light brown, ocellar spot and infuscation at base of arista brown, epandrium dark brown, and coxae, gena, parafacial, and anterior (or lateral) margin of frons usually white; sometimes lateral half of postpronotum brown (Alabama), or postpronotum and notopleuron brownish (some North Carolina specimens). Occiput usually pilose.  $M_{1+2}$  ratio 4.0–4.5. Wing lightly clouded along  $R_{2+3}$  on distal  $1/3$ . Cell bm open. Face flat.

**Female.** Externally similar to male except as follows: fore tibia light brown; hind tibia and tarsi sometimes browned (Alabama, Florida, North Carolina); tergites 3, 4, and posterior margin of tergite 2 with central stripe; tergites 5–7 brown; tergite 8 brown or with anterior half light brown.

**Male terminalia.** (Figs. 36–38) Similar to *S. atricornis* (Figs. 33–35), except surstylus broader at base, tubercle-like bristles densely arranged along surstylus, pregonite

widest basally, and lateral lobe strongly bent medially with small swelling at base of thumb; thumb short, pointed, and projecting at 90°.

**Distribution.** United States: AL, FL, NC, NJ, PA, TX (Map 1).

**Holotype.** UNITED STATES, FL: Levy Co., 7 mi NE of Cedar Key, 1 June 1970, D. L. Bailey, ♂, USNM.

**Allotype.** UNITED STATES, FL: same collection as holotype, ♀, USNM.

**Paratypes examined.** UNITED STATES, FL: Levy Co., 7 mi NE of Cedar Key, 1 June 1970, D. L. Bailey, ♂, USNM; ex. Malaise, 18 May 1970, ♀, USNM.

**Additional material examined.** UNITED STATES, AL: Baldwin Co., Bon Secour Nat. Wildlife Refuge, 5-7 May 1994, S. A. Marshall, 2♀, DEBU. FL: Santa Rosa Co., Blackwater R. St. Forest, 23 June 1973, W. W. Wirth, ♀, USNM; Levy Co., 7 mi NE Cedar Key, 1 June 1970, D. L. Bailey, ♂, ♀, USNM; Cedar Key, ex Malaise trap, 18 May 1970, D. L. Bailey, ♀, USNM; Highlands Co., Archbold Biol. Stn., 11 October 1964, P. H. Arnaud Jr., 4♀, CASC; 23 April 1967, B. V. Peterson, ♀, CNCI. NC: Columbus Co., Lk. Waccamaw, 6 July 1985, W. Steiner & A. Gerberich, ♀, USNM; Cumberland Co., Fort Bragg, J. D. Birchm., 23-25 August 1967, ♀, CASC; 16 August 1967, ♀, CASC; Bladen Co., Singletary Lk. St. Pk., 34°35'0N, 78°27'30W, Malaise, 19-22 May 2003, Marshall & Paiero, 6♀, DEBU. NJ: Oswego Lk., Burlington Co., 30 August 1974, Menke & Miller, 4♀, USNM. PA: State College, Centre Co., 4 July 1972, D. J. Shetlar, ♀, CASC. TX: Salmon, Anderson Co., 22 June 1974, H. R. Burke, Malaise trap, ♂, TAMU; 1-8 July 1974, ♂, 2♀, TAMU; 1 June 1974, ♂, 5♀, TAMU; Anderson Co., 10 mi SW Elkhart, H. R. Burke, modified Malaise, 5-6 June 1976, ♀, TAMU; Brazos Co., College Stn., Wharton, Malaise trap, 20 September–4 October 1974, ♂, TAMU; 22 July–2 August 1974, 4♀, TAMU; 14-21 July 1974, 5♂, 2♀, TAMU; Montg. Co., Jones St. Forest, 8 mi S Conroe, 28 June–13 July 1987, Wharton, Steck & Carroll, 2♀, TAMU; 21-27 June 1987, Wharton, Steck & Carroll, ♀, TAMU; 1-7 June 1987, Wang, Wharton & Praetorius, Malaise trap, ♀, TAMU; 28 April–13 July 1987, Steck, Wharton & Carroll, 3♀, TAMU.

**Comments.** See comments for *Sobarocephala affinis*.

*Sobarocephala pengellyi* spec. nov. (Figs. 12, 42–44; Map 11)

**Description (Fig. 12)**

**Male.** Body length 2.9-3.8 mm. Bristles brown. Two dorsocentral bristles plus one minute bristle in front of anterior dorsocentral. Acrostichal bristle present. Two pairs of well-developed lateral scutellar bristles. Arista sparsely plumose. Sides of frons parallel. Scutum yellow with lateral margin brownish behind light brown notopleuron; scutellum with thin light brown central stripe extending onto base of scutum. Pleuron light yellow with anepisternum and anterior face of katepisternum yellow. Coxae white. Legs light yellow

with fore tarsi light brown. Head yellow with face light brown centrally, gena and parafacial white and pilose, occiput white and ocellar tubercle brown. Abdomen predominantly yellow with wide light brown central stripe on tergites 2-4 (tapering anteriorly on each tergite) and epandrium brown (lighter on distal half).  $M_{1+2}$  ratio 3.0. Wing clear or with light apical cloud around  $R_{2+3}$ . Cell bm open. Face flat.

**Female.** As described for male except as follows: scutum with one pair of light brown lateral spots at base; scutellar stripe most pronounced apically (sometimes continuing onto base of scutum); laterotergite sometimes with light brown stripe lateral to scutellum and one stripe below; fore tarsi brown; face yellow (sometimes with orange tint); central stripe on tergites 2-4 brown, thin, and of equal width along length; tergites 5-7 brown and sternites 6 and 7 brown.

**Male terminalia.** (Figs. 42-44) Sternite 5 evenly setose. Sclerites of annulus well-developed. Length, height, and width of epandrium subequal; tapered to base. Surstylus 7/10 height of epandrium and broadly rounded; tubercle-like bristles along apical and posterior margins. Cerci small, rounded, and slightly projecting. Hypandrium with arm and ventral lobe subequal in length, and ventral lobe with two short medial bristles and one minute distal bristle. Phallapodeme and basiphallus well-developed. Epiphallus minute. Pregonite large and ovate with five central bristles. Postgonite absent. Distiphallus 7/10 length of phallapodeme; lateral lobe strongly bent, spinulose distally, with broad flat medial lobe, and with thumb absent.

**Distribution.** United States: AL, GA (Map 11).

**Holotype.** UNITED STATES, GA: Forsyth, 2 June 1970, ♂, CNCI.

**Paratypes.** UNITED STATES, AL: Baldwin Co., Raft River Tributary, 16 October 2001, 30.52.261N, 87.56.934W, J. W. McCreadie, 2♀, DEBU. GA: same collection as holotype, 10♀, CNCI.

**Comments.** *Sobarocephala pengellyi* can be distinguished from congeners by a black epandrium, one pair of lateral subbasal spots on the female scutum, a light facial spot, a relatively short surstylus, and a characteristic lateral lobe on the distiphallus.

**Etymology.** The specific name is a patronym dedicated to the late D. H. Pengelly, a great entomologist whose spirit lives on in the community of entomologists associated with "his" insect collection, the University of Guelph Insect Collection.

*Sobarocephala quadrimaculata* Soós, 1963 (Figs. 1, 27-29; Map 3)

*Sobarocephala nitida* Soós, 1963: 393.

*Sobarocephala quadrimaculata* Soós, 1963: 394. Sabrosky & Steyskal, 1974: 374.

**Redescription (Fig. 1)**

**Male.** Body length 2.9-4.4 mm. Bristles yellow with lateral scutellar bristles dark

brown. Two dorsocentral bristles. Acrostichal bristle absent. Two pairs of well-developed lateral scutellar bristles. Ocellar bristle absent. Arista densely plumose. Sides of frons converging posteriorly. Scutum yellow with one pair of short transverse presutural spots behind postpronotum and one pair of large, quadrate, postsutural spots on lateral margin; small triangular spot sometimes in front of scutellum. Scutellum and laterotergites dark brown. Pleuron yellow. Coxae white. Legs yellow with fore tibia and tarsi brown; fore tibia and basal 2/3 of fore tarsomere 1 yellow in lighter specimens; hind tibia sometimes light brown. Head yellow with parafacial and (sometimes) gena white, first flagellomere with brown dorsal stripe, and ocellar tubercle brown. Abdomen yellow with epandrium and tergites 2 (medially), 3, 4, 5 (medially) and 6 brown.  $M_{1+2}$  ratio 4.0-4.2. Wing lightly clouded in cell  $R_1$  and around  $bm-cu$ , and with dark infuscation distally on  $R_{2+3}$  (appearing "smudged" to  $R_{4+5}$ ). Cell  $bm$  closed. Face convex on dorsal half below antennal bases.

**Female.** Externally as described for male except tergite 1 with large oval spot and abdomen past tergite 6 yellow. Female from Alabama with scutellum yellow medially.

**Male terminalia.** (Figs. 27-29) Sternite 5 evenly setose. Annulus with sternites 6 and 7 reduced to thin but well-sclerotized band ventrally. Epandrium as wide as high and almost as long as high. Surstylus rectangular; tubercle-like bristles long, curved, and terminal. Cerci flat with one longer central bristle. Hypandrial arm relatively long and sharply angled with base projecting at 90° basally; ventral lobe wide, slightly shorter than arm, and with one minute and two long distal bristles. Phallapodeme well-developed with head reduced. Pregonite long, thin, and setulose medially and apically. Postgonite small, rounded, and setulose. Basiphallus small. Epiphallus long and thin. Distiphallus  $\frac{3}{4}$  length of phallapodeme and wide distally (appearing "spoon-shaped"); lateral lobe large, broad, and serrate distally, with thumb absent.

**Distribution.** Bahamas, Colombia, Costa Rica, Mexico, Nicaragua, Panama, United States (AL, FL, GA, TX) (Map 3, in part).

**Holotype.** UNITED STATES, FL: ♀, USNM.

**Additional material examined.** COSTA RICA. **Guanacaste:** 14 km S Canas, F. D. Parker, 19-28 February 1990, ♀, EMUS; 5-10 August 1990, ♂, EMUS; 20-30 October 1989, ♂, EMUS; 28 July 1991, ♂, EMUS; 1-7 April 1991, ♂, 5♀, EMUS; 8-15 February 1991, 2♂, 3♀, EMUS; 20-24 March 1989, ♀, EMUS; 16-22 February 1990, ♂, 3♀, EMUS; 1-5 August 1992, ♀, EMUS; 19-28 February 1990, ♂, 2♀, EMUS; 1-15 July 1991, ♂, EMUS; 16-26 January 1990, ♂, EMUS; 24-31 May 1990, 2♂, EMUS; 23-28 February 1990, 7♂, EMUS; 5-11 January 1991, ♂, EMUS; 1-10 July 1991, ♀, EMUS; 2-4 June 1991, ♀, EMUS; 9-14 February 1989, ♀, EMUS; 3 km SE R. Naranjo, F. D. Parker, 15-25 January 1993, ♀, EMUS; 21 July 1993, ♀, EMUS; 11-20 December 1992, ♀, EMUS; S Canas, F. D. Parker, 7-10 March 1989, ♀, EMUS; 28 July 1991, ♀, EMUS; 21-25 January 1989, 2♀, EMUS; 9-14 February 1989, ♂, EMUS; Santa Cruz, P. N. Marino Las Baulas, 0 m, 14 December 2000, Malaise, Y. Cardenas, ♀, INBC. **Heredia:** LaSelva Res. Sta., 11-17 June 1986, W. Hanson & G. Bohart, ♂, EMUS. **Limon:** Cuatro Esquinas, P. N. Tortuguero, 0 m, September 1989, J. Solano, ♀, INBC. **Puntarenas:** Pen. De Osa, Puerto Jimenez, 10 m, P. Hanson, January 1991, ♀, DEBU; May 1991, ♂, DEBU; November 1991, ♀,



DEBU; May 1992, ♂, DEBU; 5 km N Puerto Jimenez, 10 m, May 1991, P. Hanson, ♂, 2♀, DEBU; Malaise trap, June–July 1990, ♀, USNM. **COLOMBIA.** Tol. Armero, Malaise trap, 30 January–5 February 1977, E. L. Peyton, ♀, USNM. **HONDURAS.** Roatin Isl., 27 February 1979, G. E. Bohart, ♀, EMUS, Roatin Isl (west), 1 January 1980, 2♀, EMUS. **MEXICO.** Jalisco: Puerto Vallarta, 1 January 1971, sea level, P. H. & N. Arnaud, ♀, EMUS; Puerto Vallarta, G. E. Bohart, 10 December 1988, ♀, EMUS; 8 December 1984, ♂, EMUS; Quint. Roo, sweeping, F. Carillo, 10–14 October 1986, 2♂, EMUS. **NICARAGUA.** Puerto Rabezas, July 1971, J. Maldonado, ♀, USNM. **UNITED STATES, AL:** Mobile Co., Chunchula (site 20), Malaise, 25 October 2004, 30.90N, 88.20W, E. Benton, 2♀, DEBU. **FL:** Royal Palm Pk., 29 January 1933, A. L. Melander, ♀, USNM; Gainesville, 8–22 December 1986, hardwood forest, Malaise trap, W. Mason, ♂, ♀, CNCI. **GA:** Georgia: Liberty Co., St. Catherine's Island, 18–21 September 1972, F. C. & B. J. Thompson, ♀, AMNH. **TX:** Austin, 28 October 1951, M. R. Wheeler, ♀, AMNH.

**Comments.** *Sobarocephala quadrimaculata* is a relatively common species from Florida and Mexico to Colombia.

***Sobarocephala setipes* Melander & Argo, 1924 (Figs. 15, 59–61; Map 12)**

*Sobarocephala setipes* Melander & Argo, 1924: 47. Sabrosky & Steyskal, 1974: 384.

**Redescription (Fig. 15)**

**Male.** Body length 2.4–2.9 mm. Bristles light brown. Two dorsocentral bristles plus one minute bristle in front of anterior dorsocentral. Acrostichal bristle absent. Two pairs of well-developed lateral scutellar bristles. Arista sparsely plumose. Sides of frons parallel. Scutum yellow with posterior corner of notopleuron and (often) one pair of wide basal stripes brown. Scutellum yellow (sometimes with brownish central tint). Laterotergites brown lateral to scutellum; yellow in specimens from Florida and holotype with posterior notal stripes also absent. Pleuron yellow, with meron and posterior half of katepisternum white. Legs yellow, with coxae and basal half of femora white and fore tarsi light brown to brown. Head predominantly yellow, with gena, parafacial, and occiput white and pilose, ocellar tubercle brown, and light infuscation sometimes around base of arista. Abdomen yellow with wide stripe on tergites 2–5 (also tergite 6 in one FL male).  $M_{1+2}$  ratio 3.2–3.7. Wing clear. Cell bm open. Face flat.

**Female.** Similar to male except as follows: anterior half of notopleuron and postpronotum sometimes brown; notopleuron with central light brown spot; tergite 6 with wide central stripe. One female from Florida (CNCI) with distal 2/3 of fore tibia brown, and several females from Québec with fore tibia light brown. Ontario specimens sometimes with corners of scutellum brown.

**Male terminalia.** (Figs. 59–61) Sternite five with comb of bristles on posteromedial margin. Annulus reduced to thin band ventrally. Epandrium as high as wide and length 3/5 height. Surstylus short and rounded; tubercle-like bristles absent. Cerci small, rounded, slightly sunken below distal margin of epandrium, and bristles short and subequal in length. Hypandrial arm short, thin and projecting distally; three minute distal bristles on ventral

lobe. Phallapodeme thin and shorter than length of hypandrium. Pregonite clavate with one distal bristle. Postgonite minute. Basiphallus 1/3 length of phallapodeme. Epiphallus absent. Distiphallus ¼ length of phallapodeme; lateral lobe small and ovate with thumb absent.

**Distribution.** Canada: ON. United States: FL, IL, IN, LA, MD, MI, MS (Map 12).

**Holotype.** UNITED STATES, MD: Marlboro, 19 June 1916, R. C. Shannon, ♂, USNM.

**Additional material examined.** CANADA, ON: Wellington Co., University of Guelph Arboretum, ex. dung, 8 August 2004, J. Klymko, ♂, DEBU [in alcohol]; 9 August 2004, O. Lonsdale, 2♀, DEBU [in alcohol]; 12 August 2004, O. Lonsdale, 3♂, ♀, DEBU [in alcohol]; 19 July 2005, O. Lonsdale, ♂, DEBU [in alcohol]; Essex Co., Point Pelee N. P., forested area by west beach, Malaise trap and pans, 10-21 July 1999, O. Lonsdale, ♂, DEBU; Carleton Place, 27 July 1959, J. G. Chillcott, ♀, CNCI; Ottawa, J. R. Vockeroth, 13 August 1974, ♂, CNCI; 28 July 1964, ♀, CNCI; damp second-growth *Acer-Betula* wood, 11 July 1991, ♀, CNCI; 16 July 1991, ♀, CNCI; 3 August 1992, ♀, CNCI; Perth Rd., Rideau Tr., 14 July 1981, H. J. Teskey, ♀, CNCI; North Gower, 10 August 1984, D. Bell, ♀, CNCI. UNITED STATES, FL: Gulf Hammock, 23 April 1952, G. Peck, ♀, CNCI; Sarasota Co., Myakka R. St. Pk., 21 May 1973, W. W. Wirth, Malaise trap, ♀, USNM; Alachua Co., Pierce's homestead, W. H. Pierce, 13 October 1973, Malaise trap, ♀, USNM; Alachua Co., Chantilly Acres, 25 April 1970, W. W. Wirth, Malaise trap, ♀, USNM; Gainesville, Doyle Corner



MAP 12. Distribution of *Sobarocephala setipes* Melander & Argo.

Bldg., 23 September 1973, H. V. Weems Jr., Malaise trap, ♀, USNM. **IL:** Champaign Co., Brownfield Woods, 2 mi NE Urbana, 26 June 1976, C. T. Maier, ♀, EMUS; Equality, 11 September 1952, M. R. Wheeler, 2♀, AMNH. **IN:** La Fayette, 2 July [year not given], ♀, USNM; La Fayette, J. M. Aldrich, 5 August [year not given], ♀, USNM; 31 July [year not given], ♀, USNM; 23 July [year not given], ♀, USNM; 1 August [year not given], ♀, USNM. **LA:** Chicot S. Pk. nr. Ville Platte, September 1954, M. Wheeler, ♀, USNM. **MD:** Montg'y Co., Dickerson, 14 July 1974, G. A. Foster, ♂, ♀, USNM; Glen Echo, J. R. Malloch, 16 July 1922, ♂, ♀, USNM; 9 July 1922, ♀, USNM; 2 July 1922, 2♂, USNM. **MI:** Wayne Co., Grosse Isle, 21 July 1957, G. C. Steyskal, ♀, USNM; St. Joseph, **Berrien Co.**, 17 April 1972, D. D. Wilder, ♂, CASC. **MS:** Forrest Co., 6 mi W Wiggins, Sweet Bay Bog, dung trap, 5-8 May 1994, sphagnum, S. A. Marshall, ♀, DEBU.

**Comments.** *Sobarocephala setipes* is largely sympatric with the similar *S. lachnosternum*, but *S. lachnosternum* occurs west into Saskatchewan, Lake Superior, Texas, and Utah (Map 9), and is not known from the southeastern United States.

*Sobarocephala setipes* is sometimes attracted to dung, and we have observed copulating pairs on dung baits in mid August in the University of Guelph Arboretum.

***Sobarocephala texensis* Sabrosky & Steyskal, 1974** (Figs. 17, 57, 58; Map 8)

*Sobarocephala texensis* Sabrosky & Steyskal, 1974: 381.

**Redescription (Fig. 17)**

**Male.** Body length 2.6 mm. Bristles brown. Two dorsocentral bristles. Acrostichal bristle absent. Two pairs of well-developed lateral scutellar bristles. Arista sparsely plumose. Sides of frons parallel. Thorax yellow with narrow light brown spot from base of scutum to center of scutellum. Legs yellow with fore tibia and tarsi brown. Head predominantly yellow, with occiput white, gena and parafacial white and silvery tomentose, first flagellomere with infuscation at base of arista and ocellar tubercle brown. Abdomen yellow with wide central stripe on tergites 2-5.  $M_{1+2}$  ratio 2.8-3.7. Wing lightly clouded along anterodistal margin. Cell bm open. Face flat.

**Female.** Externally as described for male.

**Male terminalia.** (Figs. 57, 58) Sternite five with comb of bristles on posteromedial margin. Sclerites of annulus well-developed. Epandrium as wide as high and length 2/3 height. Surstylus rounded and 2/5 height of epandrium; tubercle-like bristles absent. Cerci small, rounded, slightly sunken below distal margin of epandrium, and with all bristles short. Hypandrium with one minute distal and one short and one long medial bristle on ventral lobe; arm atrophied, distal, and projecting at acute angle to long axis of phallapodeme. Phallapodeme relatively thin. Pregonite rectangular with one distal bristle. Basiphallus well-developed. Epiphallus and postgonite small. Distiphallus 2/3 length of phallapodeme with lateral lobe well-developed.

**Distribution.** United States: TX (Map 8).

**Holotype.** UNITED STATES, TX: Rio Frio, Leakey, Real Co., 23 May 1972, W. W. Wirth, ♂, USNM [not examined].

**Allotype.** UNITED STATES, TX: same collection as holotype, ♀, USNM.

**Paratypes examined.** UNITED STATES, TX: same collection as holotype, 2♂, ♀, USNM.

**Comments.** *Sobarocephala texensis* differs from the similarly coloured *S. setipes* (Fig. 15) in having a yellow thorax with a light median stripe on the scutellum that extends onto the base of the scutum.

*Sobarocephala wirthi* spec. nov. (Figs. 11, 45–47; Map 11)

**Description (Fig. 11)**

**Male.** Body length 3.3–5.0 mm. Bristles dark brown. Two dorsocentral bristles plus one minute bristle in front of anterior dorsocentral. Acrostichal bristle present. Lateral scutellar bristles weak. Arista sparsely plumose. Sides of frons parallel. Notum yellow with notopleuron and (sometimes) postpronotum brown; supra-alar spot sometimes present (Georgia) and confluent with notopleural spot. Pleuron, coxae, and femora white, with yellow spot on anepisternum. Legs yellow (entirely yellow in Georgia specimens) with fore tarsi brown and fore tibia usually light brown to brown. Scutellum with brown apical spot (highly reduced in some North Carolina specimens) that is sometimes wide and attaining anterior margin of scutellum. Laterotergites variably coloured. Head yellow with face light yellow, ocellar tubercle brown, and parafacial, gena, and occiput white; gena pilose. Abdomen yellow, sometimes with lateral margins of tergites (2)3–5 lightly infuscated (Georgia).  $M_{1+2}$  ratio 3.3. Wing clear, but if scutellar stripe entire, wing dusky in cell  $R_1$  and around distal 1/3 of  $R_{2+3}$ . Cell bm open. Face flat.

**Female.** Externally similar to male except as follows: central stripe on scutellum weak if entire; abdomen partly yellow, with tergite 6 brown, tergite 7 brown basally and laterally, and posterolateral margins of tergites 2–5 with light brown spots.

**Male terminalia.** (Figs. 45–47) Sternite 5 evenly setose. Sclerites of annulus well-developed. Epandrium as wide as high and with length 4/5 height. Surstylus as high as epandrium and subtriangular; tubercle-like bristles along posterior and apical margins. Cerci small and rounded with one pair of longer central bristles. Hypandrium with one minute distal and two long medial bristles on ventral lobe, sometimes with two minute distal bristles and three long medial bristles. Phallapodeme well-developed with head thin and recurved. Pregonite thin and elongate with four distal bristles. Basiphallus and postgonite small. Epiphallus as large as basiphallus in outline. Distiphallus half length of phallapodeme; lateral lobe well-developed with thumb short, thin, and strongly projecting.

**Distribution.** United States: DE, FL, GA, MD, NC, NJ (Map 11).

**Holotype.** UNITED STATES, MD: Montg'y Co., Colesville, W. W. Wirth, 11 July 1974, ♂, USNM.



**Paratypes.** **UNITED STATES, DE:** Rehoboth, W.W. Wirth, Malaise trap, 18 July 1972, ♂, ♀, USNM. **FL: Jackson Co.,** Florida Caverns State Pk., 26 May 1973, W. W. Wirth, Malaise, ♂, USNM; **Liberty Co.,** Torreya State Pk., 13 June 1974, H. V. Weems Jr. & C. R. Artaud, Malaise trap, ♀, USNM; 5 July 1965, H. V. Weems Jr., Malaise trap, ♀, USNM; **Alachua Co.,** Gainesville, Austin Cary Forest, G. B. Fairchild, 30 August 1976, ♀, USNM; 30 July 1976, ♀, USNM; 11 June 1976, insect flight trap, ♂, ♀, USNM. **GA:** Athens, 8-11 July 1969, R. & J. Matthews, Malaise, ♀, EMUS; Forsyth, 2 June 1970, 23♂, CNCI. **MD: Montg'y Co.,** Colesville, W. W. Wirth, 11 July 1974, ♂, 2♀, USNM; 4 July 1976, ♀, USNM; Malaise trap, 26 June 1977, ♀, USNM; 30 June 1977, ♂, USNM; Glen Echo, 25 June 1922, J. R. Malloch, ♀, USNM. **NC: Wake Co.,** 7 air mi SW of Raleigh off rd., C. S. Parron, Malaise trap, 17 July 1985, ♂, NCSU; 10 July 1985, 2♂, NCSU; 29 June 1985, ♀, NCSU; 31 July 1985, ♀, NCSU; 25 June 1985, ♀, NCSU; **Mecklenberg Co.,** 22 June 1996, T. Daggy, ♀, NCSU. **NJ:** Oswego Lk., **Burlington Co.,** 30 August 1974, Menke & Miller, ♀, USNM.

**Comments.** See comments for *Sobarocephala latifrons*.

**Etymology.** The specific name honours the late W. W. Wirth, who collected most of the type material.

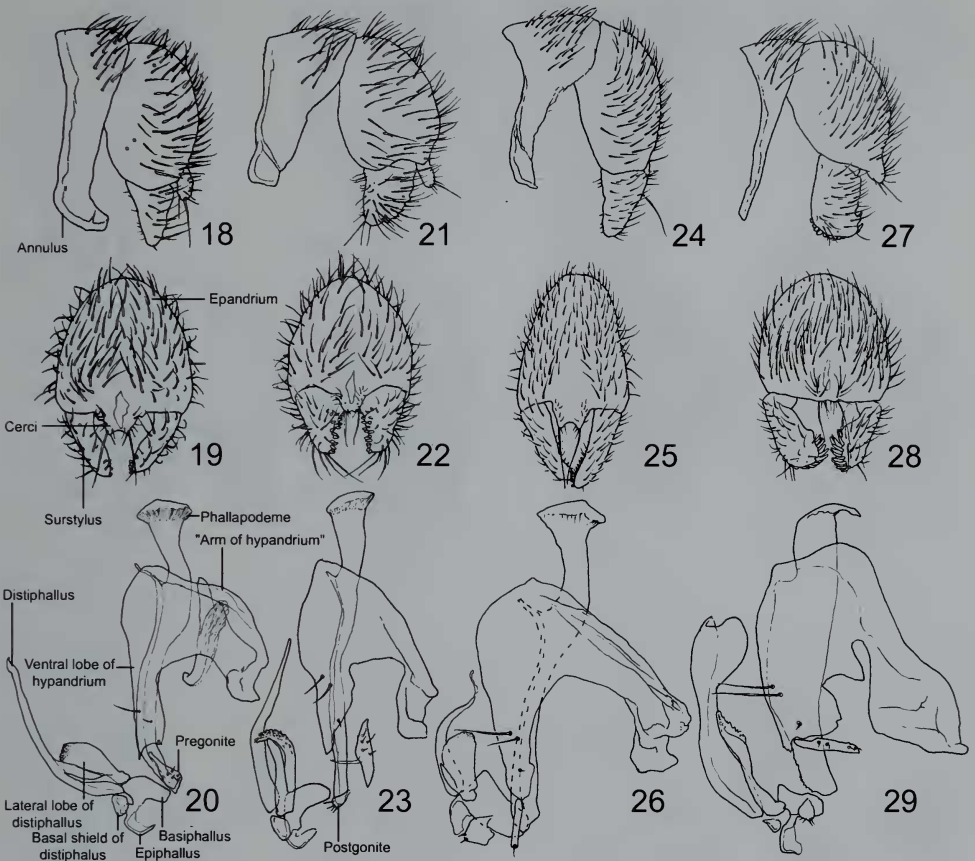
## Acknowledgements

We would like to thank a number of people for their aid in the preparation of this paper, including the curators who loaned us most of the material used in this study: T. Nguyen and D. Grimaldi (AMNH), K. Ribardo and N. Penny (CASC), C. Young (CMNH), D. M. Wood, J. R. Vockeroth, J. O'Hara, S. Brooks, J. Skevington, L. Bartels and J. Cumming (CNCI), W. Hanson (EMUS), M. Zumbado and M. Solis (INBC), P. Perkins (MCZC), R. Blinn (NCSU), E. Riley (TAMU), A. Freidberg (TAUI), and D. Furth, A. Norrbom and F. C. Thompson (USNM). W. Reeves (Center for Disease Control and Prevention, Atlanta, GA) graciously donated material from the southern United States. Comments provided by two reviewers were greatly appreciated. This study was supported by NSERC discovery grants awarded to Stephen Marshall, and NSERC and OGS grants awarded to Owen Lonsdale.

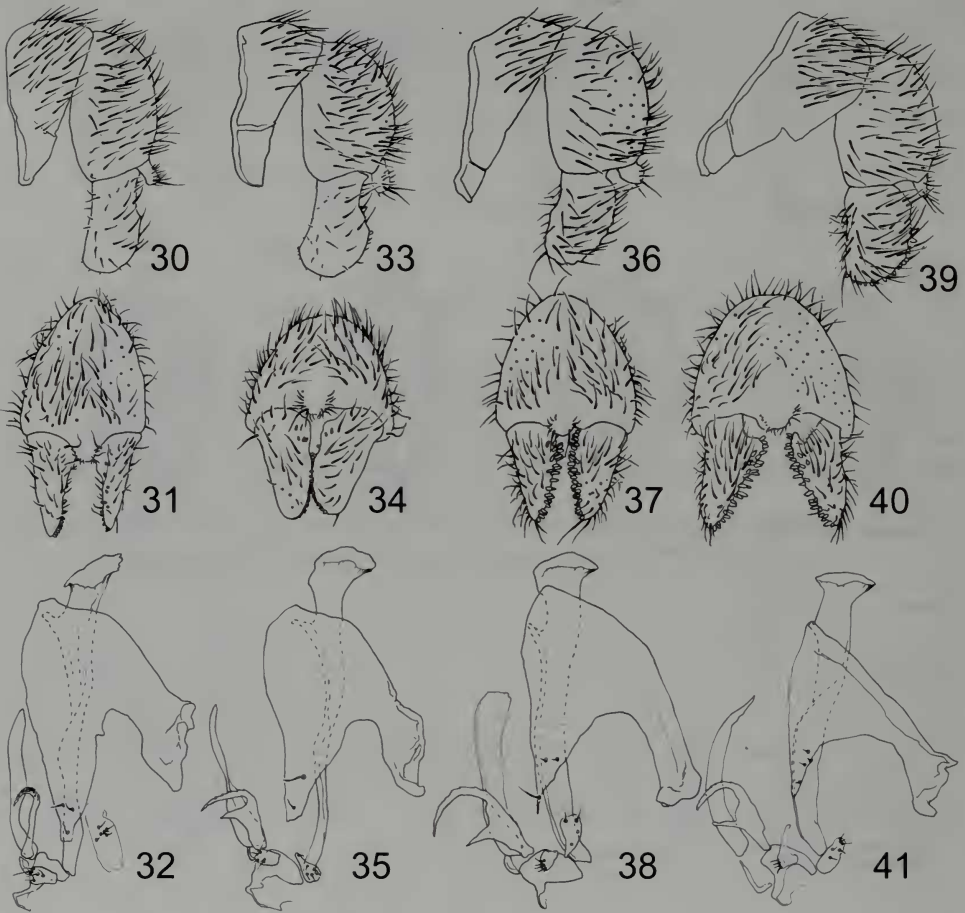
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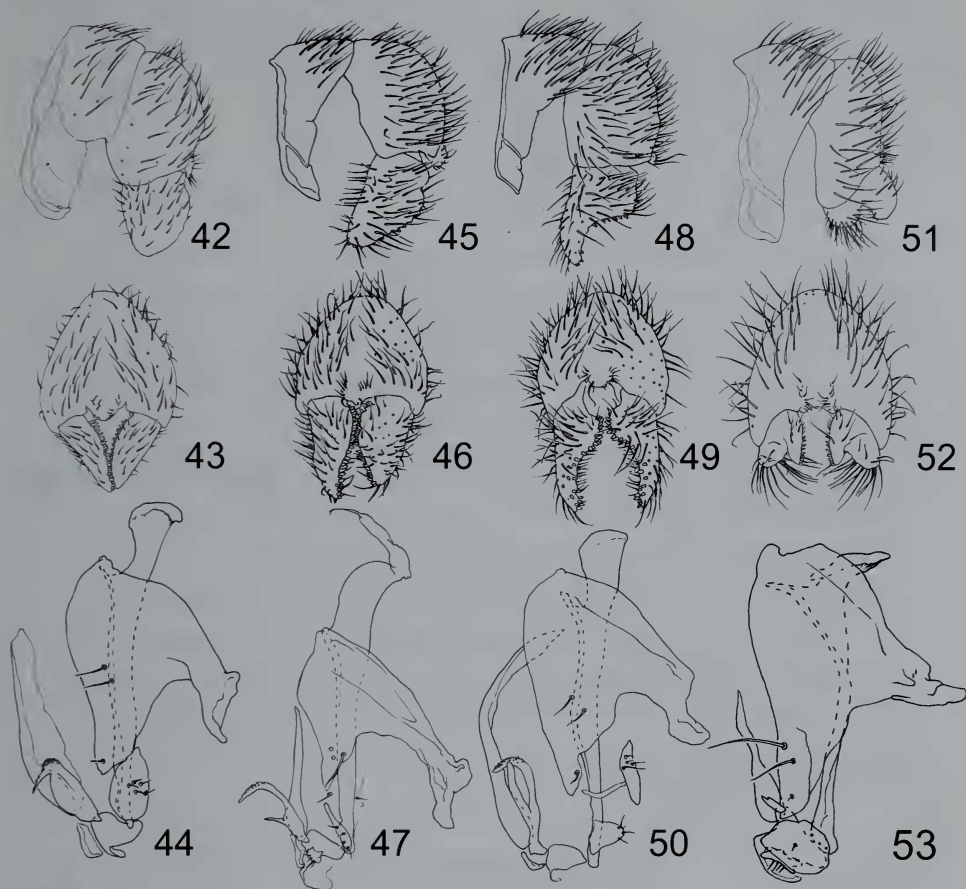


FIGURES 18–20. *Sobarocephala flaviseta* (Johnson), male terminalia. 18–external, left lateral. 19–external, posterior. 20–hypandrial complex, left lateral. FIGURES 21–23. *S. latifacies* Sabrosky & Steyskal, male terminalia. 21–external, left lateral. 22–external, posterior. 23–hypandrial complex, left lateral. FIGURES 24–26. *S. cruciger* Sabrosky & Steyskal, male terminalia. 24–external, left lateral. 25–external, posterior. 26–hypandrial complex, left lateral. FIGURES 27–29. *S. quadrimaculata* Soós, male terminalia. 27–external, left lateral. 28–external, posterior. 29–hypandrial complex, left lateral.

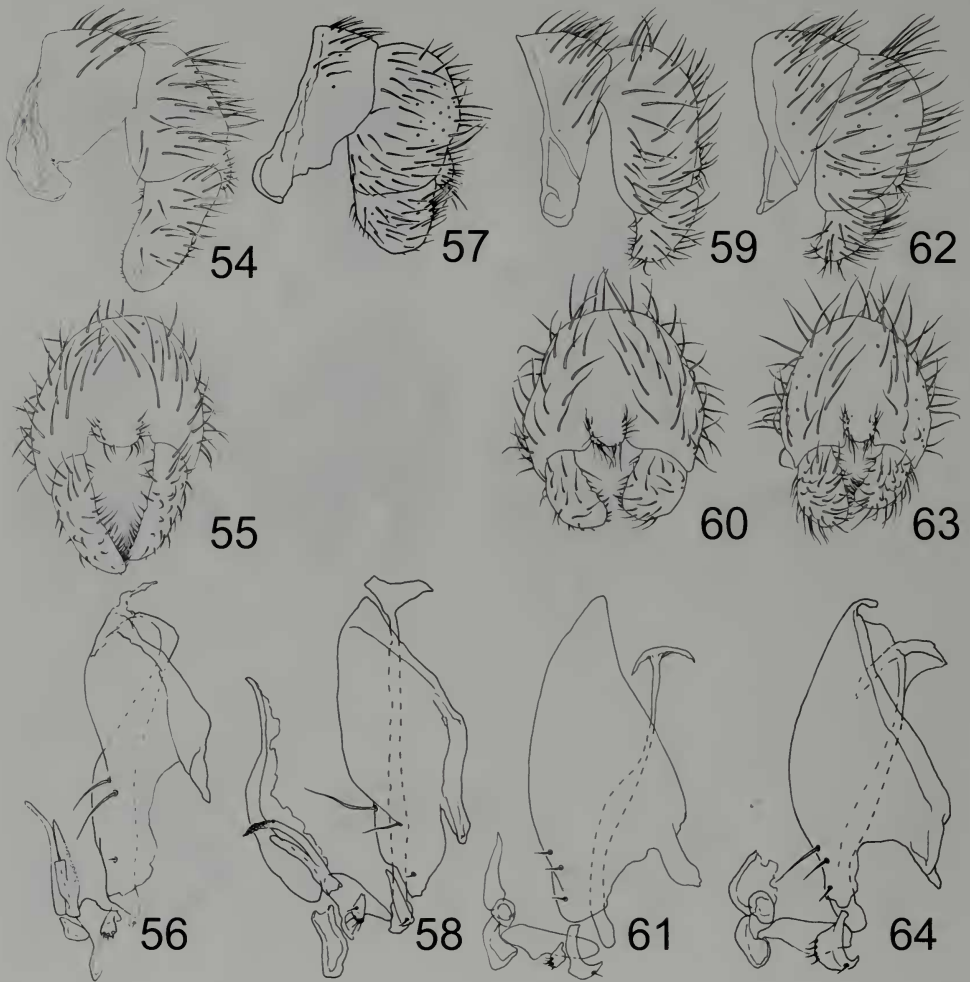


FIGURES 30–32. *Sobarocephala atricornis* Sabrosky & Steyskal, male terminalia. 30—external, left lateral. 31—external, posterior. 32—hypandrial complex, left lateral. FIGURES 33–35. *S. flava* Melander & Argo, male terminalia. 33—external, left lateral. 34—external, posterior. 35—hypandrial complex, left lateral. FIGURES 36–38. *S. muesebecki* Sabrosky & Steyskal, male terminalia. 36—external, left lateral. 37—external, posterior. 38—hypandrial complex, left lateral. FIGURES 39–41. *S. affinis* (Johnson), male terminalia. 39—external, left lateral. 40—external, posterior. 41—hypandrial complex, left lateral.





FIGURES 42–44. *Sobarocephala pengellyi* spec. nov., male terminalia. 42–external, left lateral. 43–external, posterior. 44–hypandrial complex, left lateral. FIGURES 45–47. *S. wirthi* spec. nov., male terminalia. 45–external, left lateral. 46–external, posterior. 47–hypandrial complex, left lateral. FIGURES 48–50. *S. latifrons* (Loew), male terminalia. 48–external, left lateral. 49–external, posterior. 50–hypandrial complex, left lateral. FIGURES 51–53. *Sobarocephala interrupta* Sabrosky & Steyskal, male terminalia. 51–external, left lateral. 52–external, posterior. 53–hypandrial complex, left lateral.



FIGURES 54–56. *Sobarocephala dreisbachi* Sabrosky & Steyskal, male terminalia. 54–external, left lateral. 55–external, posterior. 56–hypandrial complex, left lateral. FIGURES 57–58. *S. texensis* Sabrosky & Steyskal, male terminalia. 57–external, left lateral. 58–hypandrial complex, left lateral. FIGURES 59–61. *S. setipes* Melander & Argo, male terminalia. 59–external, left lateral. 60–external, posterior. 61–hypandrial complex, left lateral. FIGURES 62–64. *S. lachnosternum* Melander & Argo, male terminalia. 62–external, left lateral. 63–external, posterior. 64–hypandrial complex, left lateral.